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Editorial Comment . . .

Changing Costs

IN TODAY'S highly competitive market, the sellers of goods have been forced to employ ingenious methods in order to survive. The time has now passed when a manufacturer could take a reasonable cost of putting goods on the market and then add a percentage for his profit. When such a practice existed, goods were in short supply and buyers were competing for their share of what was available. Today the buyers can exercise much more discrimination in their choice and thus put pressure on the sellers for both price and quality.

In order to meet the demands of the buyer and thus retain an adequate share of the market, manufacturers have had to change their emphasis on control of the various parts of the organization. First, they recognize that the hourly cost of labor is relatively fixed because of union contracts. Thus, in order to overcome this rigidity, plants are becoming more mechanical and automated. However, mechanical aids are available to all producers, so to gain further advantage in costs, producers resort to substitution of new types of materials. Because of the great advances in material research, it is now possible for many manufacturers to exercise more control over material costs than they can over the cost of labor.

In the manufacture of consumer goods, firms have developed a vast number of new products. Many of these products can justify the costs of their development and production only through the advantage of being first on the market. Usually a firm with a new product retains its monopoly a very short time, because other products will soon be introduced that will be superior or at least similar enough in utility to be highly competitive.

Out of these changes in the way a business is conducted, there have emerged new and important specialists who were unheard of in most firms a decade ago. Perhaps one of the most prominent groups to emerge is research and development which creates the vast number of new products. Such specialists have emerged as the

maintenance engineer who is responsible for keeping the highly complicated and expensive plant running. There is also a small core of people who concentrate on developing and testing new materials. Thus, what once was the responsibility of one or two men has been subdivided into many specialized and highly technical tasks. At the same time other areas that were once all-important, are now considered of less importance because of the limited amount of control that can be exercised over them.

This changing emphasis in industrial production and control, should be of vital interest to the cost accountant. Industrial accounting techniques have grown in order to give adequate costs and controls over the older methods of production. Little study has been given to control of such areas as research and development, advertising, and maintenance. Methods of measuring costs and assessing the worth of expenditures in these areas are still rather crude if they exist at all. Because of the large expenditures connected with product research, advertising, and the installation of automatic equipment, it becomes of much greater importance to measure the probable results of these expenditures and to control the costs before the projects are launched than to try and obtain a measure of control afterwards. Because of the nature of these expenditures, once the project has been approved and a course decided on, the costs become relatively fixed and all that can be hoped for is to avoid unnecessary waste. Furthermore, in many cases, such as turning to expensive automatic machinery, the fixed costs will be a burden to the firm all through the life of the equipment.

The basic tools of the cost accountant should still be valuable in the analysis of the cost structure in the present industrial climate. However, it is very necessary for him to be aware of this dynamic changing nature of industry. A good appreciation of basic principles, together with the ambition to acquire new tools as they are needed, is a first requirement. The second important step is to be able to assess and analyse the situation in order to apply the proper tools and knowledge for a solution. Many cost accountants have the necessary raw material to make their presence felt in the present business arena; only those with the determination to contribute much will leave their mark.

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IS YOUR PURCHASING DEPARTMENT GETTING THE MOST OUT OF ITS ACCOUNTING?

by Robert H. Van Voorhis,
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There is much that accountants can do in the way of recording and reporting to help the purchasing department realize its full potential. In this article, the author offers some specific suggestions on how to apply the techniques of cost analysis and control to the procurement function to bring greater savings and increased efficiency.

IS YOUR purchasing department realizing the full potential benefit from its accounting records and reports? Or is the record keeping considered merely an unavoidable and tedious chore? Most businesses recognize the need of keeping some records, but many fail to receive the benefits which appropriate records and reports can provide. Many of the techniques and refinements of cost analysis which have long been applied in the manufacturing area have more recently been adapted to the administrative and distribution functions of business, including procurement and related activities.

INCREASED RECOGNITION OF THE IMPORTANCE OF THE PROCUREMENT FUNCTION

In the past decade, more recognition has been accorded the procurement function in many businesses, and the purchasing department has increased significantly in stature and importance in many firms. Prior to World War II there was a tendency for production personnel to determine exactly what should be purchased, in some cases even to the quantity, timing, and source of supply. Under these conditions, the purchasing agent could do little but buy what he was told on the best possible terms. During World War II, many goods were in short supply, and the problem became one of obtaining needed items almost regardless of price. It has been largely in the post-war years that the purchasing department has been recognized and accorded organizational status coordinate with other major departments in business management.

In his *Procurement—Principles and Cases* (Irwin, 1952), Howard T. Lewis notes these trends in the evolution of the procurement function (p. 2):

"To any careful observer, five trends may be noted particularly: (1) a growing recognition by top management of the basic importance of procurement as one of the major functions of business; (2) a growing recognition of the integral interdependence of design, production, and supply in determining proper quality; (3) a

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growing awareness of the essential nature of inventory control, particularly so far as production materials are concerned; (4) a corresponding organizational trend to consolidate the several aspects of procurement into an executive department to be grouped under some such title as that of 'materials management'; and (5) an increasing concern over the definite need for acquiring and developing the right type of procurement personnel."

PURCHASING DEPARTMENT RESPONSIBILITIES

In a particular company, the responsibilities of the purchasing department may not include all of the broad aspects of procurement. Frequently excluded are contracts for advertising, auditing, engineering consultation, insurance, and construction, and the purchase and installation of heavy manufacturing equipment. Although not primarily responsible, the purchasing department may participate in conferences and negotiations relating to these items, particularly construction contracts and procurement of equipment, where its knowledge of purchasing techniques and problems can be particularly helpful.

In its 1955 report, *Internal Audit and Control of a Purchasing Department*, the Research Committee of the Institute of Internal Auditors noted (p. 12-13):

"Many Purchasing Departments have assigned responsibilities which are not directly concerned with the procurement of materials, supplies, and services. Responsibilities which were most frequently found under the supervision of the Purchasing Department were:

(a) Receipt and inspection of incoming materials and supplies
(b) Authorization of payments to vendors (checking and approval of vendors' invoices)
(c) Operation of material and supply storerooms
(d) Sale of scrap
(e) Purchases for employees' personal use"

Steps in the actual purchasing operation for which the purchasing department is usually responsible are listed in the same report (p. 11) as:

"(a) Securing authorization for purchase
(b) Obtaining quotations and selecting vendor
(c) Issuing purchasing order
(d) Specifying routing
(e) Follow-up for delivery
(f) Negotiating any adjustment with vendor"

INTERNAL CONTROL AND PURCHASING

Throughout every business, sound general principles of internal control should be applied to the extent possible in every function and department. In the purchasing department, as elsewhere, internal control starts with the organization structure. Each person should understand the scope of his own authority and responsibility and his relationship with others in the department and firm. A general principle of internal control requires separation of the performance of a task and recording and reporting on its accomplishment. The organization structure should provide appropriate checks and balances and separation of functions in accordance with this principle.

Policies governing the purchasing activities should be established by top manage-

ment. Procedures to implement these policies should be established and clearly explained to operating personnel. In many cases this can best be done through a formal manual. Necessary forms should be carefully designed and controlled until properly used. It is generally desirable to prenumber forms for better control.

Accounting and other records should be kept to determine accomplishment according to responsibilities. In addition to accounting for money items, a variety of statistical data can usefully be accumulated for use in analyzing and reporting on the work of the purchasing department. These records are a key part of the internal control.

Standards of performance can be developed to measure accomplishment in clerical work and the more routine aspects of purchasing. These should be used where appropriate. However, the exercise of judgment in purchasing, which is likely to be of far more economic significance, cannot readily be measured in numerical terms nor have standards been developed for it.

Reports should provide information which will enable management to evaluate accomplishment and exercise control. To serve these purposes properly, reports should be accurate, brief and to the point, yet complete. They should be rendered promptly and in a form suited to the use intended and suited to the background and preferences of major executives to whom they may be addressed.

Internal auditing is a form of internal control which functions by reviewing and appraising the operations and other forms of internal control and thus providing both protective and constructive service to management. Originally concentrated primarily on financial matters, internal auditing has gradually broadened its field until now it covers almost all activities in many firms. The Research Report previously cited has helped bring internal auditing of the purchasing department into even wider use as another control tool for management.

SIMPLE FINANCIAL ACCOUNTING RECORDS

Even if a business maintains only the simplest of financial accounting records, expenditures are usually classified by functions or departments, and by the nature of the expenditure. All costs relating to the purchasing department might be coded to a single account in the ledger; or a simple breakdown might be kept between such kinds of expense as salaries, supplies, and equipment operation. If not analyzed in the recording process, such a breakdown might be obtained later by special analysis of the account. From even such limited information, the purchasing department activities might be studied to advantage through the accounting data.

COST ACCOUNTING RECORDS AND ANALYSES

The distinction between simple financial accounting records and cost accounting records is mostly one of degree. One might say that cost accounting records are being kept if there is a somewhat detailed breakdown in the recording of the expenditures. This in turn facilities later analysis and permits a more careful study of operations with less effort, greater speed and accuracy. Instead of a single account for the purchasing department, separate accounts might be maintained for each section or activity within the department, each broken down into considerable detail according to the nature of the expenditures made. In addition, records would be kept on the amount of each kind of work done, so that by further analysis, costs might be determined per unit of work accomplished. For example, suppose one

clerk prepares all purchase orders. If this clerk spends all of his time in this activity, the labor cost of purchase order preparation is simply the total earnings (including fringe benefits) of this clerk. The average cost for one purchase order is this total divided by the number of purchase orders prepared. This figure may or may not be a meaningful one. If each purchase order involves about the same time and effort, the average cost may be significant. If purchase orders vary widely in time and effort needed to prepare them, the average cost figure will have little usefulness. This is a hazard in dealing with figures which accountants should understand and explain to their management people using accounting data. If one adds to the labor cost of purchase order preparation the cost of the stationery and supplies involved, plus the office equipment and space used, and any other related costs, the total cost of this activity can be ascertained. An average cost per item can be calculated, and interpreted subject to the comments previously made.

Each phase of the clerical activity of the purchasing department may be accounted for and analyzed in a similar manner. This alone may provide useful information to management. Comparisons between current period results and those of prior periods should be even more useful. Standards for clerical activities have been developed and are used in many cases as a yardstick against which to measure current accomplishment. This is still better, and makes possible what is called "management by exception." Activities which reveal variations between actual cost and the established standard are examined and the causes of the variation located and corrected. Items in which performance and standard are the same can be quickly passed over.

In accounting for production costs, actual, standard, and variance amounts are often recorded in the accounts. In distribution cost accounting, usually only the actual costs are recorded in the accounts. Various analyses and comparisons with standards are made on a statistical basis outside of the accounting records. Those for the purchasing department would normally be handled in this manner. Among the advantages of this treatment, there is greater flexibility. The same figures can be analyzed in different ways to throw light on different problems. It is not necessary to perform all of the analyses continuously; they may be made periodically as called for or required by management. On the other hand, in making any particular analysis, it is necessary to make sure that all pertinent facts and figures are taken into account. If some items are inadvertently (or purposely) omitted, the analysis will not present the true picture.

ACCOUNTING REPORTS

Accounting records and analyses are designed to provide information for reports to management at various levels. Someone has said that the essence of internal reporting can be expressed in three words: accuracy, brevity, and clarity. Surely these are essentials for any good report. Timeliness should be stressed as an additional essential. Business decisions must be made promptly, and information which is not available at the proper time may be almost useless later.

Accounting reports often run largely to numbers. Non-accountants are frequently better served by reports which are mostly written in form, summarizing the results of analyses and interpreting them in a concise manner. Such reports may logically be supplemented by tabular presentation of numerical data. Comparisons with prior

results or with standards materially increase the usefulness of such presentations, by highlighting trends and variations.

The content of reports should be governed by the level of management for whose use they are intended. Thus a report to a section head should confine itself to items which are controllable at that level. Units of work accomplished may be more significant than cost figures, although both may be presented. If some items of expense are not controllable at that level and hence are omitted from the report, it will of course not show total cost. Under the supposed conditions, total cost would not be a significant figure for this level of management. As reports are prepared for department heads and for higher levels of management, the lower echelon reports are consolidated and less detail is shown. Higher levels of management have additional items of cost controllable at their levels, which would be included in their reports. Each higher level may usefully be given copies of the more detailed reports to the next lower level of management, which have been consolidated in his own report.

It is often desirable to present reports in graphic form. Charts and graphs may present a reasonably accurate picture almost at a glance. These should be attractive in order to gain the immediate attention of the reader and simple enough to get the point across quickly in an easily understood manner.

The flow chart represents another use of graphics in accounting work. The flow chart may be applied to office layout or to the movement of documents in an office routine. It is well recognized as a tool in work simplification studies and in studies of the internal controls within a procedure or department. Flow charts are particularly helpful in presenting a concise "before-and-after" contrast to management in proposing changes.

ACCOUNTING ASSISTANCE TO OTHER PURCHASING ACTIVITIES

While cost control over the clerical and other routine activities of the purchasing department is important, and can be facilitated by appropriate accounting records and reports, there are other purchasing activities which can be of considerably more economic significance. Some of these are almost impossible to measure in numerical terms. Others can be appreciably assisted by the use of appropriate accounting data.

Inventory Control.—Too much inventory ties up an excessive amount of capital, involves higher storage and handling costs, and is likely to lead to losses through deterioration or obsolescence. Too little inventory can lead to expensive work stoppages and failure to meet production schedules, to customer dissatisfaction and loss of sales. The objective of inventory control is therefore to have enough, but not too much, on hand at all times. The accomplishment of this objective may not be the sole responsibility of the purchasing organization, but is clearly related to its work. Accurate and timely accounting records can facilitate efficient inventory control.

Economic Order Quantity.—Hand-to-mouth buying results in more paper work in both buying and selling organizations, higher prices and transportation costs, and hence in higher costs per unit. It is likely to lead to material shortages. On the other hand, it avoids costs of storage and of investment in inventory. At some point there is a balance between these opposing factors, where lower purchase prices and less paper work just balance higher storage and investment costs. Formulas have

been developed to determine this economic order quantity, once the various cost factors are known. Accounting can help to provide information on costs for use in such formulas. As always, care must be exercised to be sure the appropriate cost information is presented.

Make or Buy.—Given the need for a particular item, there is often a choice between making it or buying it. Much has been written on this subject and of the factors influencing make-or-buy decisions. Some of the pertinent figures will relate to suppliers' prices, others will relate to the firm's own costs. These may be engineering estimates, but in many cases they may be similar to costs which are a matter of record obtainable through analysis of the accounts.

Electronic Data Processing.—An interesting application of electronic data processing equipment to the purchasing function is described by Frank C. Walters, "Mechanizing the Procurement Cycle," in *Purchasing for Profit,* American Management Association, Manufacturing Report Number 20 (1958). At the Baton Rouge Esso refinery, an IBM "705" and related equipment have largely mechanized the purchasing of routine items. Inventory levels are checked after each issue, notice is given when supplies reach the re-order point, and actual orders may be written automatically in some cases. Such mechanization is possible only where the electronic data processing equipment is available, and even then requires careful programming. In this case it has apparently proved very useful and has eliminated much of the clerical work formerly involved in inventory control and routine ordering.

IMPORTANCE OF COST REDUCTION THROUGH PURCHASING

Cost reduction is important in every area of business, and the operation of the purchasing department is no exception. The opportunity for cost reduction to the company is far greater, however, in terms of purchasing materials and supplies at a lower price than it is in increasing the efficiency of clerical work in the department.

In the A.M.A. Manufacturing Report Number 20 previously cited, S. D. Zemansky makes these observations in his article, "The Use of Advanced Techniques in Purchasing Management" (p. 64):

"Thus, on a broad average, the industrial purchasing function makes some 50 to 60 per cent of the expenditures comprising the total cost of the end product. . . .

"Depending on the size of the company, a one per cent cost saving on purchasing expenditures through efficient purchasing management can add more than 15 per cent to the company's nominal net profit. To provide an equivalent increase in profit, company sales would have to be increased by more than 10 per cent."

Among the advanced techniques he mentions are electronic data processing systems, value analysis, applications of the learning curve, the use of advanced mathematical and statistical techniques in determining the economic order quantity, use of correlation analysis, operations research, and analysis of suppliers' costs. The accountant can be particularly helpful in the first and last of these areas, and of more or less help in others.

HOW EFFECTIVE IS YOUR ACCOUNTING?

The foregoing suggestions should serve as a basis for re-examining the accounting in your organization as it relates to the purchasing function. There may well be room for improvement, improvement which could help increase the efficiency of the purchasing function and result in more profits for your company. There is some

opportunity for cost saving through greater efficiency in routine clerical operations. There is much more opportunity for savings in other areas of the purchasing activity, many of which can be assisted to greater or lesser extent by improved accounting.

The accountant should be alert to take the initiative in every possible way to make himself and his work more helpful to management. His is the job of educating management to the potential benefits which accounting can provide. Purchasing department management should welcome such assistance, and make an effort to obtain as much of it as can be helpful to them. In some cases, management personnel may feel that they can develop their own information better than the accountants. A word of caution may be in order to such do-it-yourself advocates. Accountants are trained in gathering and analyzing data and in helping to interpret them. Call upon them and they will be more than willing to serve.

For further reading

A CODE FOR INDUSTRIAL PURCHASING, Raymond R. Colton, *Advanced Management*, April 1961.

THE COMPTROLLER LOOKS AT THE PURCHASING DEPARTMENT, Hans C. Todt, *The Canadian Journal of Accountancy*, March 1959.

PURCHASING FOR PROFIT, Herbert J. Richmond, *The Controller*, July 1957.

ORGANIZATION FOR MATERIALS MANAGEMENT, Dean Ammer, *Cost and Management*, Dec. 1960.

THE IMPORTANCE OF BEING HUMAN (Destroy the Idol) by Alvin Pitcher

The crisis of our times is frequently referred to as the conflict of freedom and slavery, the struggle between democracy and totalitarianism. In my opinion, such an analysis is wrong. Totalitarianism of both the right and the left arose in response to the crisis in the industrial society of the West. In contending that the basic struggle is really between a society dominated by a concern over commodities and careers and one in which mental health and humanness predominate, I do not overlook the seriousness of the present East-West struggle. My aim is only to place our stake in it in proper perspective, to suggest that the victory for freedom will be hollow unless a transformed ethos guides our national life. This means a culture in which men no longer are encouraged to prove that they are worth something by displaying their competence, no longer encouraged to prove that they are competent by buying what those who have high incomes buy. This means a society in which productivity would no longer be god, a society in which productivity serves man.

Harvard Business Review, January-February, 1961

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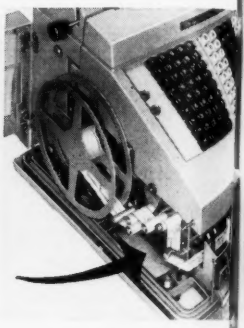

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The Economic SCENE

by W. Allan Beckett

THE MID-YEAR ECONOMIC SITUATION

"ALL is not gold that glitters." So runs the ancient proverb. If additional proof is needed one need only look at the performance of the Canadian economy in the first eighteen months of the 1960's.

To most of the pundits this was to be the golden decade. The furious pace of the '50's would not only be maintained but would accelerate as advancing technology combined with the population explosion would bring undreamed-of prosperity. But something went wrong. As far as the North American economies are concerned, the past eighteen months have turned in a lack-lustre performance. The year 1960 was almost entirely a year of softness (see *Economic Scene*, December 1960), and 1961 got off to a slow start. It is only in the last few months that Canadian business has given signs of entering a period of convalescence which may lead ultimately to recovery and the earlier promise of prosperity.

The 1960 recession began with sharp and widespread declines. As detailed in an earlier article, the elements of weakness included a sharp drop in housing construction on which was superimposed weakness in business spending for plant and equipment. The lameness in final demand produced inventory jitters in certain industries and cut-backs in stocks added to the problems as 1960 wore on. Consumer spending was capricious through part of the year, but on balance helped to restrain the drop in overall activity. Substantial strength in exports and the built-in growth factor in government spending were the major elements of strength during the recession.

The net result of the offsetting strengths and weaknesses was to produce a saucer-like rather than a soup bowl recession. In short, it turned out to be a relatively shallow decline from which we can expect a relatively moderate recovery. Moreover, the recession came at the end of a sharp, weak and incomplete expansion, and will likely give way to a similar sharp, weak and incomplete prosperity. These wrinkles—if one might use that term—have been taking place around a very slow growth trend which contrasts sharply with the rapid year-to-year advances for the period 1946-1956. Until a new dynamic occurs, or until the long-promised population upsurge begins, about 1966, this is likely to be the pattern of Canadian economic development. It is in such a medium-term framework that one should appreciate the upswing that started in Canadian business in the early months of 1961.

This moderate recovery has been sparked by the interchanging that has taken place between the strengths and weaknesses of 1960. Housing construction which showed some faint signs of revival towards the end of 1960 has grown more rapidly in the first six months of 1961 and the level of new housing starts so far this year assures a sustained level of work put in place to the end of the construction season. The improvement here, of course, feeds back to a wide group of supplying industries and should lead to improved production levels and less concern over inventories.

At the same time the decline in business spending for plant machinery and equipment appeared to have run its course by the end of 1960. The current predictions are that 1961 spending will be equal to 1960—a minimum target—and this implies a rising trend in such expenditures through the year. The stated intentions of

business men in this year's spending are reinforced by a rising trend in new orders for capital goods and new contracts being awarded for the construction of buildings.

The drag on output exerted by inventory liquidation also disappeared in the opening months of 1961. While manufacturers were still playing it close to the vest, an improved level of final consumption had dispelled doubts about the level of retail inventories. Spending for housing and other construction, for machinery and equipment and for inventories are the traditionally volatile elements that initiate business cycle expansions and declines. In the first six months of 1961 these were exerting pressure in an upward direction.

The segments of economic activity that were strong in 1960 turned weaker in the first half of 1961 and acted as a brake on the recovery. Of particular importance was the retreat in personal expenditures on consumer goods and services from the high levels reached in the fourth quarter of 1960. Consumer spending usually lags behind other developments and this sector can be expected to impart growing strength to the recovery as it proceeds through the last half of 1961 and into next year.

A second element of weakness in the first half of 1961 was the failure of our sales to other countries to maintain the high levels of 1960. Recession in the United States usually produces a lagged effect on our exports to that country. At the same time, the sharp upsurge in our sales to overseas countries has run into a temporary pause. Once again, as recovery reappears in the United States and with renewed growth in Western Europe and Japan, we can look forward to a greater contribution from exports going into 1962.

The government sector, which has recently been indifferent, if not oblivious, to activity in the economic sphere, has continued and will continue to rise during 1961.

The related signs of the business recovery in the early months of 1961 included a sharp rise in stock market prices, finally some easing in the money supply and a return of price strength to the commodity markets. None of these can be regarded as really inflationary, and finished product prices are likely to move within a narrow range during most of the year.

With a halting and possibly an incomplete recovery, the major problems such as unemployment, a balance of payments deficit and a strong competitive atmosphere are likely to remain features of the Canadian business scene for as far ahead as one can see.

The term "convalescent" used above is descriptive in the sense that it implies recovery, but not the reattainment of the robust health of the Canadian economy during the 1950's.

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FUNDED DEPRECIATION

by Robert E. Consler and
E. Leroy Knight,
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Canton, New York.

As it becomes increasingly difficult for non-profit institutions to raise capital funds, more and more such institutions will turn to the type of funded depreciation program outlined in this article, the author predicts. Though most non-profit organizations do not charge depreciation, the university described has found the funded depreciation concept a major source of moneys for building maintenance.

TRADITIONALLY, depreciation has been considered an element in cost arising from the use of long-lived assets in business operations. It represents an extreme example of prepayment of a cost which must be applied to the product over a long period of years. As an element of cost, it is closely related to the problem of accounting for profits, earnings, value of the concern, and taxes. It is in the area of reducing the tax burden that the concept has been most significant. The cost of the plant is an actual cost; its depreciation is a thoroughly valid expense item and cannot be overlooked as a part of total production costs.

Historically, there have been many systems of depreciation used in accounting practice. They have ranged from such simple ones as straight-line depreciation or productive hours to those of a more complicated nature such as sum of the digits. It is the intention of all of these systems to create a valuation account which can be used to reduce the net value of the asset, so that the asset used in the business will be properly reflected in valuation on the accounts of the corporation.

In making this charge, it has been normal to debit the depreciation expense and to credit a valuation reserve account. The depreciation expense was closed into the profit and loss statement, thus reducing profit, and in the long-run had a real effect on the actual taxes paid. The valuation account, on the other hand, became part of the balance sheet as a contra account to the asset involved, making the net value of the asset considerably less than its original cost, the amount being contingent upon the use or time involved.

It is interesting to note that, in his article of June, 1958 in the *N.A.A. Bulletin* entitled "Misunderstanding Depreciation", Mr. E. J. Schmidlein, Jr. points out clearly the "wide circulation of the fallacy that depreciation is a source of funds." Ordinarily, no one expects depreciation itself to be a direct source of funds, since there is no essential relation between depreciation and the problem of replacement. However, in our situation at St. Lawrence University, we have found it quite necessary to make our depreciation charge actually a source of funds. In the average business firm, it is expected that the charge for depreciation will reduce profits and therefore tend to conserve on paying dividends and other items which would dissipate the net asset position. While the accepted way of charging depreciation does tend to conserve assets, it does not assure that this will appear in the cash

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account. It gives an opportunity to conserve cash, but this is not a definite and guaranteed result.

DEPRECIATION PRACTICE IN NON-PROFIT INSTITUTIONS

In non-profit institutions, such as hospitals and colleges, it has not been the tradition to charge depreciation. This is because there is no pressure to maximize the statement of expenses for tax reporting purposes since these institutions are not subject to the present income taxes. Nor do these institutions have to worry about dividend distributions. Consequently, they have not given any great thought to the charge of depreciation. Another important fact which should be mentioned in this same light is that most of these institutions, those of the private type at least, depend upon gifts as their primary source of capital improvements and new buildings.

Few non-profit institutions have had to pay for buildings through the efficiency of their operation. This creates quite a different situation from the usual business practice. We at St. Lawrence University have taken the position that we should charge depreciation and currently have been using a 1% depreciation per annum on all buildings and 10% on all equipment other than automotive, which is depreciated at a 20% rate.

While it is true that the buildings at our University were given to be used for the education of young men and women of the future, the administration and Board of Trustees have taken the position that it is a trust of the University to maintain, as well as replace, the facility over a period of time through the use of depreciation funds. We have followed a very definite pattern of providing depreciation expense as part of our operating cost so that we create a clearer picture of actual operating costs. Obviously, this was not meant to cut down profits for dividend purposes as is done in business. On the other hand, in order to be realistic about the situation at hand, it has been necessary to fund this depreciation.

HOW DEPRECIATION PROVIDES CASH FOR REPLACEMENT

It is in this atmosphere that a monthly depreciation charge is actually made in the books debiting depreciation and crediting the reserve for depreciation. At the same time, a cheque is drawn upon the cash account of the University and deposited in a special investment account, thus being made available for investments. The moneys in this account are invested and the interest therefrom is accrued to the reserve. St. Lawrence University is one of the few institutions which follows this pattern, and yet it has proven to be a fine program. All minor repairs, maintenance, etc. for all buildings are charged to the regular operating account. An unusually large replacement, such as a new roof on the girls' dormitory or the replacement of worn-out boilers in the heating plant, is charged directly against the depreciation reserve account and the moneys are provided from the depreciation investments. Under this plan, while the rates may not be precisely correct, the University is attempting to maintain its plant as given by the donor through a regular repair and maintenance program. At the same time, the major replacement program is being handled through this funded depreciation.

The actual moneys in this reserve are invested by a Committee of the Board of Trustees and are kept in fairly secure and liquid types of securities. All charges to this account must first be approved by the Buildings and Grounds Committee of the Board of Trustees so that no routine items are charged to the account. Only the

unusual, the important, and the large item is charged to this account and only those that can be proven necessary for the extended life of the building.

RESULTS OF THE PROGRAM

The program has proved most successful and we feel that the donors, in many cases, have been sympathetic to our system of trying to protect over a long period of time their original gift through the funded depreciation concept. Certain similar institutions do not agree with us at all. They feel that the charge of depreciation in the expense account is an unfair charge, since the property was originally given without cost to the University. Therefore, no monthly charge should be made for its use to the operating account. This charge tends, they claim, to increase expenses unfairly. Since most non-profit institutions try to live within a balanced budget, some say the depreciation charge will rob the educational program of certain opportunities for better use of these same funds. Another argument of our opponents is that there is no point in trying to maintain the original building for the donor since, when the building needs major overhauling, the University merely asks its constituents for additional moneys in the form of gifts to repair the old building or to build a new one. Unfortunately, we are not in a position to call upon constituency as freely or as often as some others. We are a growing institution and we feel that new moneys are needed for additional buildings rather than for the replacement of older buildings. However, the position that has just been stated is typical of many of our wealthy schools which are able to call upon their constituency or alumni to replace those nostalgic buildings as they wear out.

The funded depreciation concept as applied by the University is not necessarily applicable to all types of non-profit institutions, but it does have its place and has been certainly most successful in our particular situation. Wider adoption by non-profit institutions of the funded depreciation program, or depreciation of any type, has been hampered by continual financial pressures in other directions.

CONCLUSION

Marion H. Simpsen in an article called "The Fallacies and Postulates of Accounting" in the February, 1958 issue of the *N.A.A. Bulletin* said, "A depreciation charge does not provide cash in itself." No truer words could be said. However, you have just been shown an exception, in that, when the depreciation charge is made, the cash is segregated so that it will be used specifically in the future for his purpose. It should be very clear by now that, while the depreciation charge does not provide cash in itself, it is the basis on which the cash can be segregated from the general funds of the organization and put in a special account for this purpose. It might be said in closing that, while this system appears to be well designed for a non-profit institution, a number of business institutions would find it convenient to have the actual cash on hand to replace worn-out equipment. At present, it sometimes takes additional new financing and scrambling in order to work this program out. Some adaptation of this system may be used in many of our business firms in years to come.

If the funded depreciation program had been followed by American railroads for the last several decades, their present problems might be less pressing. What about the future of our airlines in the light of this same situation? Regardless of what may happen in the future to profit-making enterprises, we are convinced that, as it becomes increasingly difficult for non-profit institutions to raise capital funds, more such institutions will give consideration to this type of funded depreciation program.

TOPICAL

comments

LOOKING AHEAD

Shortage of top managers within the next ten years is predicted. Forecast is that the most eligible management group—30 to 44 years of age—will decrease 2.6% in the next decade. *(Management Methods)*

New battery-operated power drill will go on the market in the fall. Only four pounds in weight, the new cordless drill is powerful enough to drill holes in metal plates in seconds. (*Bus. Week*, Apr. 22, 1961)

The Canadian lumber industry is looking more and more to scientific research to improve the quality and competitiveness of its product. New methods include:

- Injection of the slow-growing Douglas Fir with radioactive isotopes to speed growth. This species normally takes 60 years to reach commercial maturity.
- Addition of new preservatives to increase the durability of the wood so that it can be used in place of concrete for foundations and pilings.
- A new method of fire-proofing lumber. A compound of ammonium salts is pressure-forced into the wood which gives off carbon and water vapor to resist burning if fire strikes. (*Can. Bus.*, Apr. 1961)

The exploration of outer space is creating a great demand for expert mathematicians. American universities will produce only about 300 Ph.D. mathematicians this year, whereas about 2,000 are needed. Mathematicians are needed for design of space vehicles, for launching and for calculation of trajectories and re-entries *(MSU News Services)*

OF GENERAL INTEREST

The Canadian traffic accident rate rose 2.1% last year to 247,576 from 242,429 in 1959. The number of persons injured increased 6.4% to 90,138, while the number killed rose from 3,231 to 3,270. (*DBS*, Apr. 21, 1961)

Governments of the U.S. and Canada are broadening investigations into the price-fixing game. At the same time top business leaders are holding post-mortems and are concerned that these investigations will attach a stigma to business generally. They are trying to find a way out of the complex dilemma of meeting competition yet staying within the law. In a recent *Dun's Review* Presidents' Panel of some 200 leaders the following four questions were asked; opposite each question is the majority opinion of these business leaders:

"Do you think the present restrictions on price-fixing in the anti-trust law are in need of revision?—YES

"How do you feel about the sentences handed down in the recent electrical industry cases?—TOO HARSH

"Do you think the company punishments imposed on implicated executives were too severe?—YES

"Could executives in your company enter into price-fixing conspiracies without your knowledge?—NO" (*Dun's Rev.*, May 1961)

Major categories of Canadian university income in 1960 were: income from government grants, except for research, 45%; students' fees, 28%; sponsored or assisted research, 15%. Academic and research activities accounted for 79% of expenditure; plant maintenance, 12%; administration, 5%. Total operating expenditure was 19% greater than in the previous year. (*University Affairs*, Apr. 1961)

Profits on the sales dollar in Canada's manufacturing industry in 1960 dropped to 4.4 cents, the lowest in 13 years, a Canadian Manufacturers' Association survey shows. This figure is seven-tenths of a cent less than the profit figure of 1959 and 1.1 cents lower than the average of annual profits between 1948 and 1960. *(C.M.A. News Release)*

ON THE PERSONAL SIDE

The average life expectancy of a newborn baby today is now 68 years, according to latest life insurance company statistics. In comparison, the life expectancy of a baby 17 years ago was 62 years and 100 years ago it was 41 years. The average 50-year-old person today can expect to live another 23 years—three years more than in 1941. (*Impact*, May 1961)

Changes in temperature and humidity can cause basement pipes to "sweat" and drip water. Wrapping several layers of newspaper around the pipe is a temporary measure. Much better and almost as inexpensive is a waterproof wrapping material sold in any hardware store. Spiralled around the pipe, the wrapping is permanently held in place by its adhesive lining. Water condensation on the tanks inside the home can be collected by setting trays beneath them. (*Precis*)

A $3-million electronically operated traffic control system that has been tested in Metropolitan Toronto is expected to save vehicle owners $2 million a year through fewer delays. At present, the system can increase traffic volume 20% and could add up to savings of between $20-$40 million in road construction costs. (*Fin. Post*, May 6/61)

How is your reading speed? The average businessman reads at about the rate of 250 to 350 words per minute but experts say we can double or triple our speed by focussing on groups of words rather than on individual words. It has been estimated that 80% of adults ought to be able to read at speeds of between 200 and 220 w.p.m. but, in fact, the range varies widely between 150 and 600 w.p.m. even for people who have similar interests and work backgrounds. (*The Manager*, Mar. 1961)

PAYNE, PATTON & PUGSLEY
CHARTERED ACCOUNTANTS
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The Editor's Choice

IS YOUR ACCOUNTING SYSTEM PRODUCTIVE?

by H. N. Kamph, N.A.A. Bulletin, March 1961.

This article gives some illustrative examples of how accountants can give excellent service to management. In order to achieve effectiveness in an accounting and reporting system it is necessary for the accountant to keep abreast of the latest techniques in accounting, and then to become more aware of executive needs in the decision-making process. Most accountants who read this article will find that there is still a vast field in which insight and imagination can produce reports that will greatly enhance their status in the eyes of higher management.

UPGRADING INDUSTRY'S PLANT

Special Report, Dun's Review and Modern Industry, March 1961.

"There are times when you just can't stop building." This report starts with this quotation from a top executive. It then goes on to consider the reasoning behind capital spending and the areas in which current emphasis is being placed. The report is developed under five headings—(1) "New Profits from Old Plants" concerns itself with modernization of old facilities, (2) "Second Guessing Comes High"—choice of plant site, (3) "How to Write Your Own Ticket"—pointers on overseas construction, (4) "Our Boom That Won't Quit"—customer service labs for testing, (5) "Brick and Mortar Comes of Age"—advances in construction technology. This report should be of interest to the executive who is concerned with decisions in this field and also to the accountant who should be supplying information for decision making.

HOW TO INSTALL A COST SYSTEM

by W. I. McNeill, The Controller, March 1961.

In this article the author avoids discussion of the "best" type of cost system. He begins his article by commenting on the lack of literature on the "how" and "what" to do in actual practice. He then outlines the primary needs for a set of company objectives to serve as guides in designing the system, and the choice of an accounting philosophy so that controversial questions will not keep recurring. The greater part of the article is given over to a check list of things to do, with explanations on the more difficult steps.

WHAT GOOD ARE ANNUAL MEETINGS?

by T. A. Wise, Fortune, April 1961.

What purpose does the annual meeting serve? What changes are taking place in the annual event? What steps are being taken to protect the shareholders' rights and who are the crusaders? With an increasingly large number of people owning stock, many companies have some interesting plans to have a more democratic representation of owners present at the annual accounting for stewardship.

DIRECT COSTING

Bulletin of the Australasian Institute of Cost Accountants, Jan. 1961.

This is a collection of papers on direct costing that were presented at two conventions held in Australia. These papers are well worth reading. Some are for direct costing, others against it. There are two exhibits on practical application of the technique with appropriate commentary on its use for various purposes such as cost control, pricing, and inventory valuation.

BUDGETING IN AN ELECTRICAL MANUFACTURING PLANT*

by V. C. Ibbotson
Cost Accountant, Motor Division,
Sangamo Company Limited,
Toronto, Ontario.

Budgeting is more than an effective tool for controlling expenses. It is also a means of communication that unites all levels of management in seeking the solutions to common problems. This thesis describes the application of a budgetary system in an electrical manufacturing plant through all phases of planning, coordination and control.

THE COMPANY, a manufacturer of electrical products, is a fully integrated organization with complete facilities for research, development, design and engineering. The offices and plant cover 210,000 square feet and are situated on approximately ten acres of land.

The products manufactured fall under the main headings of Meters, Motors-Wagner and Motors-Lamb. These products consist of an extensive line of electrical measurement meters, meter testing equipment, metering transformers, current transformers, meteorological equipment, Wagner electric motors ranging from 1/10 to 50 horsepower and Lamb vacuum cleaner motors.

The administrative organization consists of the following five divisions: engineering, industrial relations, manufacturing, sales, finance and general administrative.

THE COST SYSTEM

The factory accounting department is included in the manufacturing division and is responsible directly to the vice-president of manufacturing. Heading the department is the factory accountant with six assistants.

The system used is basically the standard cost method with one exception, and that is in the handling of fixed expenses. These expenses are included in the inventory values but on the profit and loss statement they are shown after arriving at the variable margin. This type of system is known as the "standard direct cost system."

Some of the more important advantages of this type of costing are:

a) Reveals the marginal income on each product and type class at all times.
b) Shows which products are profitable and which non-profitable.
c) Furnishes variable costs to management with great speed and accuracy, permitting more realistic and competitive bidding prices.
d) Indicates the fixed charges that must be cleared to show a profit.
e) The decisions to make or buy are more accurately and readily obtained.

* Condensation of a thesis submitted for R.I.A. qualification.

At present Cost Accountant of the Motor Division, the author joined Sangamo Company Limited in 1953 as a clerk. He began R.I.A. studies in 1954 and graduated this year, being one of three students to win an award from the Ontario Society for his thesis. He was born and educated in Toronto, graduating in accounting from Eastern High School of Commerce in 1948. Before joining Sangamo Company Limited, he was employed with Morley & Son of Toronto as a general accountant.

f) The variable or out-of-pocket costs are known at all times. This enables the company to accept low margin business and know what the loss will be.
g) The break-even point for any level of business activity can be computed readily.
h) Eliminates the need for determining "normal volume" and the computation of "volume variance".
i) "Cost control is made more easily attainable if a cost segregation based on the behaviour of costs is maintained."[1]

The "standard direct cost" method is by no means the answer to all problems but, through its use, the company honestly believes it has been able to secure business it might otherwise have missed.

MATERIAL STANDARDS

When the engineeering department introduces or requires a new raw material, raw or finished part to be bought outside, it writes up the specifications and applies a code or part number to that specific material. Standard quantities of this material are set by the engineering department well in advance of actual production, and are listed on a production or shop order as well as on the standard cost card. The quantity of standard material listed on these cards is sufficient to produce one hundred pieces of the part, listed on the production order.

When the cost department receives the invoices for these new materials, it sets up a standard cost and enters it on a "raw or finished bought-outside card" under the code or part number assigned to it. The cost clerk then uses these standards when building up the standard cost on the finished parts.

Material standards should be adjusted or changed to reflect factual changes in operations, either actual or anticipated. They should not be changed simply because a new fiscal year has come along. Under present-day conditions of fluctuating costs and engineering developments, we feel the need to revise the material standards annually or biennially.

LABOR STANDARDS

The labor production order which is sent into the shop lists a description of the labor operations with separate numbers assigned to each operation. The operators book on these numbers at the divisional time centres. If there is no pre-cut time card, a new card is made out by hand and stamped "set standard." This card is then sent to the factory accounting department where the cost accountant sets up the standard cost hours for one hundred pieces. Before deciding on the standard cost, several factors must first be reviewed:

1) Calculate the operator's actual efficiency.
2) Does it sound reasonable?
3) Is it a new operator? If so, make necessary allowances.
4) Is the quantity booked in a good average for that particular operation?
5) Check for similar parts and operation numbers. This should lead to setting a more reliable standard.

[1] Fiske & Beckett, *Industrial Accountant's Handbook*, p. 234, Prentice-Hall, New York, 1954.

Once the standard cost hours have been set, a pre-cut time card is then made and issued by the tabulating department. It is then filed numerically in the proper time centre for future clocking.

The above method of applying standard cost hours relates only to a labor operation on which a standard has not been set. If during the year an incentive time study is taken on such a labor operation, the present standard would remain in effect until the revision time is reached. It is at this time that the standard would be revised to agree with the time allowed on the incentive time study.

When the standard cost hours are set on a labor operation, this standard generally remains the same until the revision period.

It has been the policy of the company during the past few years to revise the labor standards annually. Some of the main reasons for this are:

1) Incentive time studies are being taken constantly.
2) Change in methods.
3) Change in machinery.
4) Change in material—quantity or type.
5) Change in department.
6) Combining and splitting operations.

DIRECT MATERIAL

The direct material required for each order is calculated from the material shop order. The foreman or job boss multiplies the order quantity by the standard quantity. This amount is entered and authorized on the material shop order and this requisition is presented to the raw stores.

The invoices for raw material purchases are summarized monthly by accounts under the following three products: Meters; Motors-Wagner; Motors-Lamb. This summary is called a "purchase distribution summary" and shows the material purchases at actual and standard costs along with the variances. The following is an example of the monthly journal entry for the distribution:

Meter raw and process inventory control at standard	$60,000.00	
Motor raw and process inventory control at standard	30,000.00	
Lamb raw and process inventory control at standard	15,000.00	
Meter variance	6,000.00	
Motor variance	3,000.00	
Lamb variance	1,000.00	
Accounts payable		$115,000.00

The above entry discloses that all direct material purchases at standard are posted directly to process inventory accounts instead of a raw stores account. The main advantage of this is the elimination of a substantial amount of internal accounting and costing.

DIRECT LABOR

The direct labor is processed by the tabulating department from the actual payroll time cards. These cards are listed in numerical operation number by department on a bi-weekly payroll distribution sheet. This sheet is then summarized by direct productive labor accounts under the following product headings: Meters; Motors-Wagner; Motors-Lamb. The bi-weekly sheets are then summarized for the month ending.

Before the direct labor summary is completed, as shown in the following illustration, the total standard cost hours per product are first converted into standard cost dollars by a predetermined cost rate chosen by the factory accountant, which remains the same for a full accounting year.

DIRECT LABOR SUMMARY
For the month of December 1959.

	Actual $	*Std. hrs.*	*Std. $*	*Variance*
Meter				
Motor-Wagner				
Motor-Lamb				

The journal entry for the above summary is as follows:

Meter raw and process inventory control at standard	$30,000.00	
Motor raw and process inventory control at standard	20,000.00	
Lamb raw and process inventory control at standard	5,000.00	
Meter variance	2,000.00	
Motor variance	2,000.00	
Lamb variance	1,000.00	
Payroll		$60,000.00

MANUFACTURING EXPENSES

The manufacturing expenses are divided by product into two classifications, variable and fixed. The variable expenses are costs that vary with changes in volume of output or rate of activity. The fixed expenses are costs that remain constant regardless of the volume of production. These expenses are first estimated and then applied to the products manufactured on an estimated basis.

Applied Variable Expenses

The variable expenses are applied monthly to a "variable expense inventory control" account. The amount charged is calculated by multiplying the monthly direct labor dollars by a set predetermined percentage. This percentage is set annually in the factory accounting department by using the past year's actual expenses for its main base.

Actual Variable Expenses

The actual variable expenses are summarized on an overhead distribution sheet and charged monthly to the same "variable expense inventory control" account as the applied. The difference between the applied and actual, which is reflected in this account, is then written off to the current month's cost of sales.

Applied Fixed Expenses

The fixed expenses are applied monthly to a "fixed expense inventory control" account. The amount charged is calculated by multiplying the individual totals of the direct labor dollars from our three main product divisions by three predetermined percentages. These percentages are also set annually in the factory accounting department.

Actual Fixed Expenses

The actual fixed expenses are summarized on an overhead distribution sheet and charged monthly to the same control account as the applied. The difference between

the actual and applied is charged to an "inventory fluctuation account" which is written off monthly to cost of sales.

PLANNING FOR THE BUDGET

The planning function focuses around two very important factors:

1) The establishment of realistic objectives.
2) The organization required to attain them.

The objectives of the budgetary program play a very important part in its success. The objectives, such as sales, production and expenses, etc., should represent goals which are reasonably attainable but which present a real challenge. Goals set so high as to be, for all practical purposes, impossible of attainment tend to discourage any serious efforts to reach them. On the other hand, goals set so low that they call forth no special effort will have no meaning or incentive.

How does one go about making these goals realistic and attainable? For example, in the construction of our divisional variable expenses, we make it a practice to ask the department head to submit an estimate of those expenses which he controls and for which he is held responsible.

Matz, Curry and Frank have this to say on the subject: "Such a procedure is of great value psychologically, for the individual department supervisor who is responsible for the expenses incurred feels that the budget figures are his estimates and he will co-operate more willingly in the execution of the budget."[1]

We believe this statement is very true and it certainly enables our management to establish more reasonable and realistic objectives. It also assists in bringing together the different levels of management.

BUDGET PERIOD

The length of the budget period that we have found most beneficial for our type of manufacturing has been one year. This type of budgeting is generally known as periodic budgeting as opposed to continuous budgeting. Although we generally follow this method, we sometimes make revisions monthly, quarterly or semi-annually. These revisions reflect any basic changes that might have taken place owing to better or worse market and business conditions. They also help to keep the budget an up-to-date and effective control tool.

LONG- AND SHORT-RANGE FORECASTING

Before describing the budget construction, it is well to emphasize that the financial planning is composed of two principle divisions: (1) short-term forecasting and (2) long-range forecasting and planning. Both types of forecasting are employed with the short-term serving as the basis for our budgets. The long-term forecast, which generally covers a period from five to ten years, is used primarily in the forecasting of certain capital expenditures and is generally considered more as a planning tool and less of a control tool.

BUDGET CONSTRUCTION

Budget construction with its practical problems and solutions can only commence after the preliminary foundation of the budgetary program has been thoroughly laid

[1] Matz, Curry and Frank, *Cost Accounting,* 2nd Ed., South-Western, Cincinnati, Ohio, 1957, p. 488.

down. A few of the more important items to be considered and decided upon for a sound program are the following:

1. How much of a business is to be covered?
2. Who is the budget director?
3. Who in the management organization is to be on the budget committee?
4. A rough approximation of the length of time it will take to make it a working tool of management.

SALES BUDGET

The sales budget, which constitutes the foundation for our entire business program, must be developed first. The first step is the sales forecast. The forecast is prepared annually from the estimates of the three divisional sales managers, which take into consideration such items as past sales performance, trends and general business conditions. The forecast figures are then presented to the vice-president and general sales manager. Using the sales forecast figures and taking into consideration such factors as prices to be charged, market research and analysis, etc., the vice-president and general manager then submits the first stage of the sales budget to the president. This shows, by type class and product division, the net sales dollars and units. After this has been accepted by the president, it is then broken down into monthly sales by product divisions. Copies of schedules are then sent to the vice-president of manufacturing who, in turn, gives them to the factory accounting department for further development.

The factory accounting department, using the figures from these schedules, then prepares a sales budget as illustrated in Exhibit 1, which shows the budgeted net sales dollars by quarter and product division.

QUARTERLY NET SALES DOLLARS BUDGET—1959 Exhibit 1

Quarters	PRODUCTS			Total
	Meters	Motors	Lamb	
1st	$ 990,000	$ 410,000	$ 40,000	$1,440,000
2nd	930,000	450,000	40,000	1,420,000
3rd	830,000	450,000	37,000	1,317,000
4th	930,000	390,000	41,000	1,361,000
	$3,680,000	$1,700,000	$158,000	$5,538,000

VARIABLE MARGIN BUDGET

The variable margin budget, which is illustrated in Exhibit 2, is a summary of the divisional budgets prepared quarterly by the factory accounting department. It shows by product and division the estimated material, labor, variable expense, variable margin dollars and variable margin percentages. To arrive at the material and labor percentages as used in columns one and two, we calculate the last three months' actual material and labor as a percentage of the last three months' actual net sales. The variable expense dollars are calculated by using an overall variable expense percentage rate.

The main advantage of the variable margin budget is that it shows at all times what the variable cost, margin and percentage are running at on all product type classes as well as divisions.

VARIABLE MARGIN BUDGET

Exhibit 2

1st QUARTER 1959

Product	Material % Net Sales	Labor % Net Sales	Av. N.S. $ per Month	Material $	Labor $	Variable Expense $	Total Var. Cost $	Variable Margin $	Variable Percent
Meters	40	10	$330,000	$132,000	$ 33,000	$ 13,200	$178,200	$151,800	46.0
Motors	35	10	137,000	48,000	13,700	5,480	67,180	69,820	51.0
Lamb	60	10	13,000	7,800	1,300	520	9,620	3,380	26.0
			$480,000	$187,800	$ 48,000	$ 19,200	$255,000	$225,000	46.9

MATERIAL BUDGET

The material budget, as illustrated in Exhibit 3, is first prepared with the first quarter broken down into the individual months. Subsequently, quarterly budgets are prepared with the same break-down. The initial step in its preparation is to bring forth the material precentages of net sales dollars as shown in column two on the summary of the variable margin budget (Exhibit 2). The next step is to take these percentages and multiply by the month's net sales dollars to arrive at a material budget.

Example		Net Sales Dollars
Meters	January	$290,000.00 x 40% = $116,000.00

1959 MATERIAL BUDGET

Exhibit 3

Product	Material %of N.S.	Jan.	Feb.	Mar.	QUARTERS 1st	2nd	3rd	4th	TOTAL
Meters	40	$116,000	$128,000	$152,000	$396,000	$372,000	$332,000	$372,000	$1,472,000
Motors	35	49,000	45,500	49,000	143,500	157,500	157,500	136,500	595,000
Lamb	60	9,600	6,000	8,400	24,000	24,000	22,200	24,600	94,800
		$174,600	$179,500	$209,400	$563,500	$553,500	$511,700	$533,100	$2,161,800

LABOR BUDGET

The labor budget follows the same steps as the material budget. It is prepared at the same time and the only difference is in the percentages used. The labor percentages (from Exhibit 2) are multiplied by the month's net sales dollars to arrive at a labor budget.

Example		Net Sales Dollars
Meters	January	$290,000.00 x 10% = $29,000.00

VARIABLE EXPENSE BUDGET

The variable manufacturing expense budgets are prepared annually by the factory accounting department and are drawn up in the first few weeks of the new accounting year. These budgets are prepared for 16 producing departments and three service departments.

The following construction procedure is the same for all departments. This procedure commences with the preceding year's actual department variable expenses being listed in the first column of the budget. The next step is to list the actual

VARIABLE EXPENSE PERCENTAGE BUDGET—1959

Exhibit 4

DEPARTMENT "C 40"

	1958 12 Months Actual	1958 Oct.-Dec. 3 Months Actual	1958 12 Months Actual Month Average	1958 Oct-Dec.. Actual Month Average	1958 12 Months Actual %	1958 Budget %	1958 Oct.-Dec. Actual %	1959 Budget Forecast
Floor Boys and Servicemen	$ 8,692.	$ 2,398.	$ 724.	$ 799.	4.34	*3.86*	4.49	4.40
Clerical	936.	266.	78.	89.	.47	*.35*	.50	.50
Job Boss and Set-Up	20,275.	5,558.	1,690.	1,853.	10.13	*10.19*	10.40	11.40
Operator Set-Up	8,981.	2,334.	749.	778.	4.49	*4.01*	4.37	4.37
Clean-Up and Handling	424.	130.	35.	43.	.21	*.13*	.24	.22
Idle Time	62.	9.	6.	3.	.03	*.04*	.02	.02
Try Out and Change Dies	—	—	—	—	—	—	—	—
Instruction and Training	171.	45.	14.	15.	.09	*.02*	.08	.08
Overtime Premium	2,677.	1,436.	223.	478.	1.34	*.89*	2.69	1.34
Make Small Tools and Gadgets	82.	23.	7.	7.	.04	*.16*	.04	.04
Department Maintenance	37.	18.	3.	6.	.02	*.07*	.03	.03
Night Shift Bonus	174.	65.	14.	22.	.09	*.06*	.12	.12
Repair Labor	4,245.	1,214.	354.	405.	2.12	*1.42*	2.27	1.52
Scrap Parts and Material	3,074.	1,802.	256.	601.	1.54	*.60*	3.37	1.00
Supplies	13,531.	3,615.	1,127.	1,205.	6.76	*7.33*	6.77	6.77
Maintenance Shop Orders	2,317.	472.	193.	157.	1.16	*1.36*	.88	1.16
Total for Budget Comparison	$ 65,678.	$ 19,385.	$ 5,473.	$ 6,461.	32.83	*30.49*	36.27	32.97
Supplementary Wages	392.	50.	32.	17.				
Inventory	306.	306.	26.	102.				
Union Meetings etc.	431.	197.	36.	66.				
Total Variable Expense	$ 66,807.	$ 19,938.	$ 5,567.	$ 6,646.				
Total Direct Labor	$200,087.	$ 53,441.	$ 16,673.	$ 17,814.				
Total Direct Hours	112,590.3	29,843.2	9,382.5	9,948				

expense figures for the last three months in column two, and then actual averages and percentages are calculated before the preliminary budget percentage is derived.

Exhibit 4 illustrates a constructed budget following the above procedure. However, before the preliminary budget percentages are completed, each foreman is requested to submit to the factory accounting department a budget containing his proposed figures. The factory accountant and foreman then compare figures. If the foreman wishes to increase or decrease any particular expense, showing sound reason for his request, then it is usually granted. This procedure is followed because:

1) The budgets are prepared to serve as a good tool for management and therefore should be reasonable and attainable.

2) Since the foreman has participated and quite possibly contributed actual figures to his budget, he will try harder to achieve them.

Once the budgeted percentages have been selected, they are then transferred to the individual department work sheets. Each pay period the direct labor hours and dollars are posted to these sheets and accumulated for the month. Exhibit 5 illustrates a work sheet. From this work sheet the monthly actual and budget figures are given to the foreman on a report which shows the budget and actual figures for the month and year to date on all variable expenses for his department.

FIXED EXPENSE BUDGET

The manufacturing fixed expense budget is prepared annually for the vice-president of manufacturing. This budget is his responsibility and is, in fact, a summary of the fixed expense budgets from the following departments:

a) Production departments—responsibility: plant superintendent
   Summary of: Producing departments Special jobs
   Industrial engineering Tool engineering and design.
b) Production control department—responsibility: production
   Summary of: Production control Shipping, receiving and stores.
c) Plant engineering and maintenance—responsibility: plant engineer
d) Three Rivers Plant—responsibility: Three Rivers Plant manager.

The above four budgets are prepared annually by their responsible personnel and presented to the vice-president of manufacturing for his acceptance. They show the monthly fixed expenses and include the fixed salaries and wages from the salary budgets which are discussed further on.

These budgets are actually preliminary figures until the vice-president has checked every item very carefully, taking into consideration many forecasts, budgets and assumptions. It is only after this that they become acceptable as budget figures. A few of the more common items that he considers are:

1) A review of the past year's actual figures as compared to the proposed budget figures.
2) How does the production budget compare to last year's — increase or decrease?
3) Is there any anticipation of a salary or wage increase?
4) Review the capital expenditures budget for the following:
   —building expansion . . . if so, heat and light expense increase
   —major repairs to building that would be capitalized

VARIABLE EXPENSE—WORK SHEET

DEPARTMENT "C 40"—DECEMBER, 1959

Exhibit 5

	11/28–12/11	12/12–12/25	12/26–1/60	Current Actual	Current Budget	Pred. %	Cuml. Budget	Cuml. Actual
Floor Boys and Servicemen	$ 42,345.	$ 37,006.	$ 18,363.	$ 932.	$ 820.	*4.40*	$ 10,695.	$ 10,450.
Clerical	6,406.	1,611.	1,668.	95.	93.	*.50*	1,216.	1,226.
Job Boss and Set-Up	113,326.	95,584.	44,511.	2,424.	2,123.	*11.40*	27,708.	27,545.
Operator Set-Up	49,037.	46,970.	31,217.	1,217.	814.	*4.37*	10,622.	12,429.
Clean-Up and Handling	1,190.	529.	317.	19.	41.	*.22*	533.	443.
Idle Time	28.	14.			4.	*.02*	49.	19.
Try Out and Change Die	202.			2.				2.
Instructions and Training					15.	*.08*	193.	81.
Overtime Premium	2,467.			25.	250.	*1.34*	3,261.	3,298.
Make Small Tools and Gadgets			662.	7.	7.	*.04*	98.	44.
Department Maintenance					6.	*.03*	73.	92.
Night Shift Bonus	1,117.	950.	336.	23.	22.	*.12*	291.	288.
Repair Labor	30,220.	15,967.	9,575.	534.	186.	*1.00*	3,963.	3,755.
Scrap Parts and Material				310.	283.	*1.52*	2,430.	3,144.
Supplies				2,126.	1,261.	*6.77*	16,455.	16,014.
Maintenance Shop Orders				211.	216.	*1.16*	2,819.	3,521.
Total for Budget Comparison	$246,335.	$198,631.	$106,649.	$ 7,925.	$ 6,141.	*32.97*	$ 80,136.	$ 82,351.
Supplementary Wages							106.	106.
Inventory							343.	343.
Union Meetings	633.	3,586.	802.	49.	49.		444.	444.
Total Variable Expense	$246,968.	$202,217.	$107,656.	$ 7,974.	$ 6,190.		$ 81,029.	$ 83,244.
Incentive Direct Labor	$448,374.	$389,265.	$161,939.	$ 9,429.				$170,608.
Daywork Direct Labor	400,453.	377,691.	174,467.	9,198.				72,446.
Total Direct Labor	$848,827.	$766,956.	$336,406.	$ 18,627.				$243,054.
Total Direct Hours	4,582.7	4,179.2	1,843.6	10,125.9				131,868.5

—new equipment which might reduce scrap or increase some factory fixed expense or supply.

5) Increase or decrease in staff.

6) Rearrangement of departments.

When these final monthly figures are attained, they are assembled into a master manufacturing fixed expense budget. This master budget is then presented to the president with an accompanying report by the vice-president of manufacturing. The master manufacturing division fixed expense budget is illustrated in Exhibit 6.

The first revision of these budgets comes at the six-month period and the second revision at the nine-month period. The main reason for these revisions is to bring into line the write-off for depreciation, vacation and statutory holiday pay.

MANUFACTURING DIVISION Exhibit 6

FIXED EXPENSES BUDGET FOR THE YEAR 1959

	DEPARTMENTS						
	Mfg. Division	Production Dep't	Production Control	Plant Eng. & Mtce.	Three Rivers	Monthly Budget	Yearly Budget
Plant Management	$ 6,618	$	$	$	$	$ 6,618	$ 79,416
Factory Accounting	1,652					1,652	19,824
Purchasing	1,942					1,942	23,304
Inspection	2,324					2,324	27,888
Staff and Operating Departments...							
Salaries		17,696	6,494	1,779	2,104	28,073	336,876
Wages			6,400	8,750	400	15,550	186,600
Allocated Expenses		3,450		9,200	3,352	16,002	192,024
Expenses not allocated							
Depreciation	23,000					23,000	276,000
Incidentals	490					490	5,880
Office Machine Service	60					60	720
Postage	200					200	2,400
Stationery & Printing Supplies	1,100					1,100	13,200
Telephone & Telegraph	650					650	7,800
Travelling	200					200	2,400
Unemployment Insurance	1,800					1,800	21,600
Workmen's Compensation Insurance	1,200					1,200	14,400
Statutory Holiday Wages	5,600					5,600	67,200
Vacation Wages	7,000					7,000	84,000
	$53,836	$21,146	$12,894	$19,729	$ 5,856	$113,461	$1,361,532

CAPITAL EXPENDITURES BUDGET

The capital expenditures budget expresses the detailed plans of top management for additions, improvements and replacements. Since all these items generally involve the more or less permanent commitment of large sums of money, decisions concerning them have a long-term and significant effect on the economic health of the concern. This fact suggests the need for careful analysis and serious planning on the part of top management. "An ill-advised decision concerning capital additions frequently cannot be rectified without seriously affecting the financial health of the concern. Errors in capital additions may result in over-investment or under-invest-

ment and consequent deterioration of the concern's competitive position in industry."[1]

The budget is prepared annually and its construction begins with the divisional supervisors submitting to the plant superintendent a preliminary report which lists their requests for new or replacement equipment. The superintendent then reviews and discusses these reports individually with each supervisor. After they have agreed on the preliminary figures, the plant superintendent then prepares a summary and submits it in a report to the vice-president of manufacturing.

Upon receipt of this report as well as a similar report from the mechanical superintendent, who is in charge of plant maintenance, the vice-president of manufacturing proceeds to review and scrutinize every item. Joint meetings between all manufacturing supervisors are then held to review these preliminary figures for any unnecessary items and possible additions. Once a reasonable agreement is reached, the vice-president proceeds to make a final budget summary which must be presented to the president for his comments and acceptance. When it has received acceptance, it does not necessarily mean that each expenditure will be made during the budget period. The deferring or cancelling of certain expenditures may be brought about by unpredictable developments, forced on us by competition and by cases where sales failed to materialize. However, we feel that this budget serves management with a valuable tool, and a definite goal to aim at, and any deviation should only be justified on the basis that the new course was unavoidable.

The capital expenditures budget is reviewed twice during the current fiscal year—at the six-month and again at the nine-month period. When the revisions are made, we may decide to increase or decrease these expenditures.

Control over expenditures is handled through "tool appropriation orders." These orders are issued on all expenditures over $250. A record of these orders and amounts charged to them is kept by the factory accounting department. Each month a report is issued which states the appropriation number, dollar allocation, expenditures to date and order completed.

The budgeted depreciation schedule is prepared by the vice-president of manufacturing and accompanies his budgeted capital expenditures.

THE CASH BUDGET

The cash budget is a short-term forecast. It is prepared annually by the vice-president and secretary-treasurer and its operating period corresponds with the general budget program. This budget is basically a summary of the cash receipts and disbursements.

The budget construction commences with the sales forecast figures being used as the basis for the accounts receivable. These receivables are than aged as to their collectability. The aging percentages are calculated from the aging analyses reports of the past five years which are prepared and issued monthly by the accounts receivable department. From these data is prepared the monthly forecast of collections from the accounts receivable. These collections, combined with the forecast of other income, are summarized in the "summary of budgeted cash receipts."

In estimating the cash disbursements, the cash requirements are mainly for the

[1] Glenn A. Welsch, *Budgeting: Profit-Planning and Control*, 4th Ed., P. 195, Prentice-Hall, New York, 1957.

purchase of raw material, direct labor, out-of-pocket expenses, capital expenditures, etc. The various current budgets of raw material, labor and capital expenditures facilitate the estimating of the cash payments. When this information is completed, a final summary is prepared called the "summary of budgeted cash disbursements."

The two schedules of the budgeted receipts and disbursements are then combined and summarized into the final "cash budget" which is illustrated in Exhibit 7.

The main purpose of this budget is to enable management to make important decisions that will keep the cash position reasonable and healthy. It follows the same pattern as many of the other budgets in that it requires periodic revisions to keep up with the fluctuating operations. Careful analysis of the variations and their causes enables this budget to be a very important tool to the good management of any concern.

CASH BUDGET Exhibit 7

FOR THE YEAR ENDING DECEMBER 31, 1959

	Opening Cash Balance	Cash Receipts	Total	Cash Disbursements	Ending Cash Balance
January	$ 50,000	$ 449,000	499,000	$ 412,540	$ 86,460
February	86,460	462,000	548,460	424,900	123,560
March	123,560	537,000	660,560	473,060	187,500
1st Quarter	50,000	$1,448,000	$1,498,000	$1,310,500	$187,500
2nd Quarter	187,500	1,429,000	1,616,500	1,340,800	275,700
3rd Quarter	275,700	1,325,000	1,600,700	1,267,780	332,920
4th Quarter	332,920	1,370,000	1,702,920	1,291,340	411,580
TOTALS		$5,572,000		$5,210,420	

PROFIT AND LOSS BUDGET

The vice-president and secretary-treasurer compiles the profit and loss budget from the various schedules. This schedule is prepared by product division and shows monthly budget and actual as well as consolidated figures.

The profit and loss budget, showing the month of January and consolidated figures, is illustrated as Exhibit 8.

BUDGET REPORTS

Good budget reports are a must. They serve as the initial step toward the third and final "control" phase of effective budgeting. Before measures for good budgetary control can be established, there must be a planned program of budget reports. These reports should indicate clearly the issuer, receivers, and the measured results of actual and predetermined plans and objectives. The reports should be prepared so that they are easily understood by the lowest level of supervision receiving them.

Our budget reports consist of two types, performance and summary. The performance reports are prepared mainly for each subdivision of the producing divisions and service departments. They illustrate the actual, budgeted and accumulated results in such a manner that it is easy for the responsible personnel to trace favorable or unfavorable performances to the original source.

The summary reports are designed for top management and give a complete and readily comprehensive summary of the performance reports.

Three levels of supervision receive these reports: management, divisional supervisors, and department foremen.

BUDGETED PROFIT AND LOSS STATEMENT

Exhibit 8

FOR THE MONTH ENDING JANUARY 31, 1959

	METERS		MOTORS		LAMB		CONSOLIDATED	
	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget
Net Sales	$285,000	$290,000	$150,000	$140,000	$ 12,000	$ 16,000	$447,000	$446,000
Material	$115,000	$116,000	$ 53,000	$ 49,000	$ 7,200	$ 9,600	$175,200	$174,600
Labor	30,000	29,000	15,000	14,000	1,200	1,600	46,200	44,600
Variable Expenses	12,000	11,600	6,000	5,600	500	640	18,500	17,840
Total Variable Cost of Sales	$157,000	$156,000	$ 74,000	$ 68,600	$ 8,900	$ 11,840	$239,900	$237,040
Gross Variable Margin	$128,000	$133,400	$ 76,000	$ 71,400	$ 3,100	$ 4,160	$207,100	$208,960
Fixed Expenses	90,000	90,000	50,000	50,000	3,000	3,000	143,000	143,000
Operating Profit	$ 38,000	$ 43,400	$ 26,000	$ 21,400	$ 100	$ 1,160	$ 64,000	$ 65,960
Miscellaneous Income Profit on Sale of Fixed Assets and Sundry Income	800	1,000	600	500	100	200	1,500	1,700
Net Profit or Loss before Income Taxes	$ 38,800	$ 44,400	$ 26,600	$ 21,900	$ 200	$ 1,360	$ 65,600	$ 67,660
Dominion and Provincial Income Taxes Estimated	20,000	22,000	13,000	11,000	100	700	33,100	33,700
Net Profit after Taxes	$ 18,800	$ 22,400	$ 13,600	$ 10,900	$ 100	$ 660	$ 32,500	$ 33,960

THE BUDGET REPORT PROGRAM

The manufacturing division expense budgets form one of the most important and comprehensive budget report programs. This covers all three levels of supervision and hence has been selected here for purposes of illustration.

1. *Management*: The reports to management, as stated previously, are mainly of the summary type. These summaries enable management to see how the budget program is progressing and to spot areas for correction.

The manufacturing expense budget reports for management consist of two main summaries:

a) The first report is a summary of the manufacturing production departments. This is the responsibility of the plant superintendent and is issued monthly by the factory accounting department to the vice-president of manufacturing.

b) The second report is the responsibility of the vice-president of manufacturing and is a monthly summary of reports from departments under his administration. This budget report is illustrated in Exhibit 9.

2. *Divisional supervisor*: The divisional supervisors receive monthly copies of the producing departments' performance budgets for which they are responsible. Along with these department budgets are divisional summary reports. These reports indicate to the supervisor the particular items that need to be looked into and, with the department budgets on hand, he is immediately able to find the department responsible.

One of the main benefits of this type of report is that it lets the supervisors know

BUDGET PERFORMANCE Exhibit 9

DIVISION NO. 1—MANUFACTURING, FEBRUARY 1959

Acct. No.		FIXED CHARGES					
		Month			Year to Date		
		Budget	Actual	Variance	Budget	Actual	Variance
20	Plant management salaries	5,000	4,900	100	10,000	9,000	1,000
21	Factory accounting salaries	2,000	2,100	(100)	4,000	3,000	1,000
22	Purchasing salaries	1,000	800	200	2,000	3,000	(1,000)
24	Inspection salaries	2,000	2,000	—	4,000	4,000	—
S	Production control	10,000	9,700	300	20,000	19,000	1,000
S	Plant eng. & mtce.	18,000	17,600	400	36,000	37,000	(1,000)
S	Three Rivers plant	4,000	4,100	(100)	8,000	8,200	(200)
S	Production depts.	17,300	17,100	200	34,600	34,500	100
	Staff & Operating Depts. total	59,300	58,300	1,000	118,600	117,700	900
	EXPENSES NOT ALLOCATED TO DEPTS.						
208-211	Depreciation—other than Three Rivers	19,000	16,000	3,000	38,000	39,000	(1,000)
244-247	Incidentals	200	300	(100)	400	500	(100)
260-263	Office machine servicing	25	30	(5)	50	50	—
272-275	Postage	100	150	(50)	200	200	—
288-291	Stationery and printing supplies	1,000	900	100	2,000	2,100	(100)
304-307	Telegraph and telephone	500	400	100	1,000	900	100
308-311	Travelling	100	150	(50)	200	300	(100)
312-315	Unemployment Insurance	1,500	1,600	(100)	3,000	4,000	(1,000)
320-323	Workmen's Insurance	1,300	1,200	100	2,600	2,800	(200)
833	Statutory holiday wages	4,600	4,700	(100)	9,200	9,000	200
826	Vacation wages	8,000	8,000	—	16,000	16,000	—
	Expenses total	36,325	33,430	2,895	72,650	74,850	(2,200)
	Total Fixed Charges	95,625	91,730	3,895	191,250	192,550	(1,300)
				VARIABLE	CHARGES		
	VARIABLE CHARGES PER MONTHLY REPORT						
24	Inspection dept.	3,500	3,900	(400)	7,000	6,800	200
30	Three Rivers plant	500	400	100	1,000	800	200
		4,000	4,300	(300)	8,000	7,600	400
S	Production departments	32,000	31,100	900	64,000	63,700	300
	Total Variable Charges	36,000	35,400	600	72,000	71,300	700
	TOTAL FIXED AND VARIABLE CHARGES	131,625	127,130	4,495	263,250	263,850	(600)

their actual and budgeted controllable expenses. It enables the supervisors to take steps to correct deviations that seem out of line.

3. *Department foreman*: The budget reports received by the department foreman are classified as performance reports and are issued monthly by the factory accounting department. They contain his actual, budgeted and cumulative figures, broken down into individual items such as supplies, idle time, job bosses, etc. This enables him to see on what specific items he has actually over- or under-spent.

FOLLOW-UP TO REPORTS

After the reports are distributed, there is a natural tendency to relax. However, the work is not finished. Now is the time to make the information go to work. Our program includes many meetings and discussions between all levels of management and supervision about their budget questions. This enables us to get at the root of the trouble (over- or under-spending) and to make the necessary decisions for correction.

CHARTS IN REPORTING

The use of charts is not new, but quite often overlooked. In recent years we have developed approximately 15 charts which relate to the manufacturing operations. These charts are plotted with monthly figures and travel through all levels of management. They quite often show trends or relationships more clearly than words or figures. The old saying, "A picture tells more than a thousand words", has certainly proved itself true in the use of these charts.

IMPORTANCE OF BUDGET REPORTS

The importance of budget reports has been summarized by Fiske and Beckett who point out that "Budgetary control reports can 'make or break' the budget program. If they are striking and influential (and, of course, founded on a sound program) they can do much to assure the success of budgeting; if they are dull and uninteresting the best program in the world is doomed to failure." [1]

ANALYSIS OF BUDGET VARIANCES

It is from the reports such as the divisional and departmental manufacturing reports, which indicate the actual and budget figures, that budget analysis is formulated.

The variances between these figures are subject to an early analysis to determine their respective causes so that corrective measures may be taken. Our budgets are prepared in accordance with the company's organization, i.e., by departments, areas of operation, etc. This enables us to tie in the budget analysis with the personnel responsible for the division or departments concerned.

Unfavorable variances demand attention first. In the sales budget unfavorable variances may be due to lower sales, lower selling prices, lower factory output, etc. The material budget may show unfavorable variances due to price increases, substitution of suppliers, change in design, etc. Unfavorable variances in the labor budget may be caused by wage increases, decrease in productivity, change in incentive allowed times, inexperienced labor, etc. All of these reasons, plus others from budgets not mentioned, provide management with useful information, but this has less significance than the information obtained from the manufacturing variable expense reports. These reports pinpoint those items of variable expense which are over-spent as well as the area of responsibility.

[1] Fiske and Beckett, *Industrial Accountant's Handbook*, P. 1041.

The supervisors first review their summary reports and items are further analyzed by reviewing their department reports. By so doing, they are able to single out by department and item those things which need questioning. Explanations are then sought from the department foremen who may at any time ask the factory accounting department (which accumulates the data for his budget report) for a further break-down of such items as:

a) The scrap tickets charged to his department.
b) Repair labor.
c) Overtime premium.
d) Idle time.

This further break-down provides the foreman with such information as:

1) What specific machines or operators are producing most of the scrap.
2) Causes of the repair labor.
3) What particular line of supplies is being over-spent.
4) What operators are on idle time.

The analysis should not stop with over-spending or unfavorable variances. Favorable or under-spending variances should also be analyzed. This type of variance could be caused by one or more of these reasons:

1) Weakness in planning. The objectives or targets have been set too high.
2) Change in the operating conditions under which the budgets were constructed.
3) Padding by the foreman. For example, if idle time is being over-spent and set-up under-spent, then he might request certain operators to apply their idle time to set-up.
4) Foremen are reluctant to hire and fire. This could produce over-spending as well as under-spending in many of their indirect labor expense accounts.

The budget variances are the fruit of any budget program. They may be sweet or sour, but in any event they should be picked and digested. If a comprehensive system of budget variances analysis is overlooked, much of the potent force of the budget system is lost. However, it should be kept in mind that these analyses are no stronger than the assumptions upon which they are based. The extensiveness of the budget analysis depends on the information available, type of variation, and the usefulness of the result.

BREAK-EVEN ANALYSIS

Break-even analyses and break-even charts are actually reporting devices which provide top management with invaluable information. This information helps them to understand the usefulness of budget procedures and estimates and assists them in making important managerial decisions.

The break-even analysis can only be made if fixed and variable components of cost can be identified with reasonable accuracy. Since our budget system employs flexible budgets, the cost variability is already determined. This variability is broken down for each product division and calculated for each month, which makes it readily usable for break-even analysis. Once these flexible budgets are constructed, numerous break-even analyses and charts can be developed with little effort and cost.

To prove this statement, let us construct a break-even chart for the first quarter

using the total sales figure of $1,440,000 which is the total of the three product divisions as shown in the net sales dollars budget (Exhibit 1). The variable expenses are taken from the variable margin budget (Exhibit 2). The figure taken is the total variable cost from column five, which is $255,000 multiplied by three, as this budget is an average month for the first quarter. The fixed expenses are a total of the manufacturing, selling and administrative fixed expenses. The manufacturing figure (of $113,461 x 3) is taken from the manufacturing division budget as illustrated in Exhibit 6. The selling and administrative is taken from the selling and administrative fixed expense budgets.

Break-even analysis calculations for the above:

Sales		$1,440,000
Variable cost		$ 765,000
Fixed Manufacturing	$340,000	
Selling	200,000	
Administrative	100,000	640,000

$$B/E = \frac{640{,}000}{\frac{765{,}000}{1{,}440{,}000}} = \frac{640{,}000}{1-.53} = \frac{640{,}000}{.47} = 1{,}360{,}000$$

From following the steps above it can be observed how readily the break-even analysis can be computed. These computations may be made monthly, quarterly or yearly, depending on what the analyst desires.

PROFIT-VOLUME ANALYSIS

When the break-even analysis is computed on a valid basis, it then indicates to management the point where there is no profit or loss. However, management wants to know also what will be the results under specific changes in some or all of these assumptions. This type of analysis is known as profit-volume analysis.

The profit-volume analysis is simply the determination of what happens to profits when changes occur or are anticipated in the volume, cost, price and product mix. Some of the typical types of everyday management problems that incur these changes are as follows:

a) Contemplating a change in the sales mix in the direction of the more profitable lines.
b) Viewing the fixed, variable and total costs as varying volumes.
c) How much sales need to be increased to offset an increase in variable cost (possibly a wage increase) and yet retain the same profit rate.
d) Sales volume increase to compensate a sales price reduction.

The profit-volume analysis, based on total costs and total sales dollars, results in the net profit or loss being in total. This figure is very beneficial, but no longer do cost analysts look only at the total cost. In our manufacturing concern, we have found it very advantageous to have a further analysis of what each product division contributes to this total.

Our variable margin budget, illustrated in Exhibit 2, shows what revenue each product division contributes to the balance of sales revenue over variable costs. This budget shows the total of the three product divisions. We have a further break-down of this into product type classes which is too lengthy to show here. However, this further break-down is invaluable in helping management to decide whether to make, to buy, or to discontinue certain lines.

CONCLUSIONS

Our budget system has come a long way in recent years, but I believe it still has a few weaknesses and is not being used quite as efficiently as possible. The system of analyzing the causes of over- or under-spending on the departmental variable expense reports could be improved. It would be better if the department foremen first analyzed their reports and then issued written reports, each to his supervisor. These reports should be issued one day after the foremen receive their expense reports and should list significant variances, say in excess of $100. They should have supporting detail figures with brief comments for each such variance. My main reasons against the old method are:

a) The divisional supervisors have multiple department budgets to analyze. This is time consuming and the foremen might develop a tendency to sit back and wait for their supervisors to question out-of-line variances.

b) Under the old method, the supervisor usually looks at his summary of the various departments first. This can be seriously misleading. Though a total variance of a certain expense may be nil, a look at the break-down of the various departments could reveal heavy over-spending in one department and under-spending in others.

Once the supervisors have received these suggested reports, I would recommend that they should, in turn, issue a summary report to the plant superintendent. These summary reports should also contain the significant variances supported with detail figures and brief comments.

Another improvement that should be considered involves the time element between actual expenses taking place and their being reported to the foremen. We all know that the value of information decreases with delay but, on the other hand, it may be very costly to report this information immediately. In my opinion, the present time period of approximately six weeks between the commencement of expenses and their being reported to the foreman, is too long. I would suggest that some form of intermediate reports, such as weekly or bi-weekly, should be issued. It is my contention that if this time element were reasonably reduced, even gradually, a marked improvement would be realized in the variable expense variances.

For further reading

BUDGETING—TOOL FOR PROFIT MANAGEMENT, R. W. Fisher, *Cost and Management*, Feb. 1961.

A CASE STUDY IN BUDGETARY PLANNING AND CONTROL, Carl D. Crankshaw, *N.A.A. Bulletin*, Nov. 1960.

BUDGETING IN ACTION, F. A. Buttner, *The Australian Accountant*, Sept. 1960.

GETTING THE MOST OUT OF OPERATING BUDGETS, Peter M. Chiuminatto, *N.A.A. Bulletin*, Aug. 1960.

EVALUATING RESEARCH ACTIVITIES

by Clyde W. Meder,
Manager of Administrative and Engineering Budgets,
Wright Aeronautical Division,
Curtiss-Wright Corporation, New Jersey.

As more money, men and facilities are channelled into industrial research, the need for evaluating such expenditure increases. Management requires assurance that its investment in money and men is profitable. This article describes some of the yardsticks that companies are using to measure the results of their research activities.

ALL COMPANIES evaluate their research in some manner. However, the methods and the degree of evaluation vary with different companies. Many use a financial evaluation while others use a formal approach. Some use a financial evaluation to develop a type of profit and loss for the research operation. Others use a strictly technical evaluation, and still others use both a financial and technical approach.

There is no doubt that research is profitable, but the results of research are not easily measured. Many of the benefits from research are hidden, and it is difficult to appraise their contribution to the success of the company. A further complication may arise in that, even though a new product is developed, the manufacturing operation must produce it at a profitable cost and the sales department must market it. Regardless of the difficulties involved in evaluating research, an evaluation of some kind is required to justify its existence and perpetuation.

ADVANTAGES OF A FORMAL EVALUATION

As research has advanced and grown in industry, the methods of evaluation have also advanced and grown. The degree of evaluation will vary with the size of the company and the size of the research activity. However, a detailed evaluation should be made on a formal basis regardless of size. Such an evaluation will aid in determining whether or not an adequate return is being made on the company's research investment and will serve to stimulate further research. The evaluation will also serve as an index for future reference in the selection of new projects. Even though the project may fail, valuable data and information may be obtained which will be useful in the selection of future projects and in the projects themselves.

The formal evaluation can also be used for determining the quality of results. This means the suitability for the intended use of the product or process in production. A successful project not only involves the creation of the project, but it also investigates production potential and feasibility. It may be possible to produce it by the ounce in the laboratory but impossible to produce it by the ton in the plant. Thus, an evaluation will give an overall indication of the final success of the research effort.

FINANCIAL EVALUATION

Management is interested in measuring the financial return realized from research because the ultimate justification for research is based on profits. Research contributes to profits through the introduction of new products which increase sales volume. It also contributes to profits by reducing costs when it improves processes, facilities, and materials. Finally, an increase in sales volume or in sales price can be

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achieved by an improvement in the quality of the product as a result of research effort.

Many research projects do not appear to contribute materially to increased profits or decreased costs. Instead, they may help to maintain the company's profit position in a competitive market. Fundamental or basic research, while it has no direct application to the product line, may aid in the solutions of other problems.

Financial evaluation of research is most significant in appraising benefits which can be applied to the development or improvement of products or processes. Projects of this type can be evaluated by the comparison of cost savings or profits with the cost of research required to develop it and with the capital expenditures needed to utilize research results. However, any evaluation of research on a financial basis must be qualified by the contribution of the manufacturing and sales effort. As a result, the evaluation of research by such methods must be qualitative and care must be taken to distinguish research's contribution from the others.

The methods of financial evaluation fall into three basic groups of criteria: (1) those related to the effect on sales volume or revenue, (2) those related to the effect on savings in materials, labor, or other costs, and (3) those related to the effect on profits.

In the first group of criteria, consideration is given to the following results of research projects: (1) increased business, (2) increased output without an increase in investment, (3) per cent of products from research, (4) effect of new products on old product sales.

The group of criteria relating to the effect on savings in material, labor, or other costs includes: (1) use of by-products, wastes, idle facilities, or less profitably employed facilities, (2) reduction of the product line, (3) better process yield, (4) substitution of cheaper materials, (5) increased utilization of labor.

The third group of criteria relating to the effect on profits includes: (1) profit on research versus non-research products, (2) profit and loss analysis for the research effort, (3) pay-back time on projects, (4) percent of return on investments.

In a survey[1] conducted by the writer of 60 major companies, 24 companies or 40% reported that they based a formal evaluation of their research activity on financial data. The 24 companies which reported using a financial evaluation were asked, "What basis is used to evaluate research activity?" Sixteen of the 24 companies reported using the effect on sales volume and the effect on savings in costs, while 13 companies used effect on profits as criteria for evaluating research. Very few of the companies relied on one of the factors only. For the most part companies used a combination of two of the factors. The most significant comment regarding financial evaluation stated that such an evaluation by itself did not adequately furnish a good yardstick for measuring results. Another tabulation of these results showed that 16 of the 24 companies using financial criteria, used also a technical evaluation at the same time. It can be concluded that the use of financial criteria is limited in industry.

TECHNICAL EVALUATION

Technical evaluation of research is both quantitative and qualitative. The goal of a research project is a direct product. This direct product takes the form of new

[1] Survey conducted by the writer in 1958 in the preparation of his Master's thesis at Fairleigh Dickinson University.

knowledge, a new formulation, a patent application, a product specification, an operating instruction, diagnosis of difficulties, or even a service report. However, while the success of research depends on the quality and usefulness of the findings, it must also depend upon the ability and willingness of the company to apply these findings.

Technical evaluation of research not only takes place after the project has been completed but before its inception and while it is in progress. It may be responsible for not starting the project, and it may also be responsible for discontinuing activity before completion. Technical evaluation, as referred to in this article, applies to the evaluation of the completed project or effort in order to determine whether the results achieved were as expected. The technical criteria which can be used in evaluating research are as follows: (1) number of patents granted, (2) number of new products, (3) proportion of products from research, (4) number of valuable ideas.

The survey found that 43 of the 60 companies responding to this inquiry used a technical basis for evaluation. This was 72% as compared with 40% using a financial basis. Only ten companies, or 16.5%, reported that they did not make any evaluation at all. Of interest was the fact that 16 companies, or 26.5%, used both a financial and a technical evaluation.

In order to determine what technical criteria were used, the 43 companies were asked what basis or bases they used for evaluation. The predominate basis was the number of new products reported by 60.5% of the companies, followed by the number of valuable ideas by 56% of the companies. Other bases reported were the proportion of products from research by 49% and the number of patents by 32.5%.

The remaining 30% used other bases. One company uses the number of disclosures (a variation of the number of patents) and the number of scientific papers published as well as the number and type of scientific awards given to the research people. They also felt that the amount of royalty income and the income from the sale of "know-how" served as criteria. Two companies use their rate of technical advancement in their respective fields to gauge results.

Four companies reported that their research was judged by the endorsement of the operating departments of the company which received benefits from the research program. They felt that inasmuch as the operating expenditures are approved and paid for by the operating departments of the corporation, their approval of the expenditures in increasing amounts is indicative of value received. In this plan where the money comes from several sources, close liaison is necessary with each sponsor. Thus, it is possible to keep abreast of all problems, both short- and long-range that may need the help of research and development. Likewise, status of current research projects can be discussed and evaluated along with a report on the commercial status of previously solved problems. If the research department considers a problem to be essential but cannot find a sponsor, it has a limited amount of its own funds available.

WHAT IS THE ANSWER?

There is no doubt that research effort should be evaluated. Any company to survive in today's competitive market must continually evaluate its operations, not only to improve its profit position but in order to maintain it.

S.I.C.A. News

INCORPORATED 1920

ONTARIO SOCIETY HOLDS GRADUATION CEREMONIES

The facilities of the Royal Connaught Hotel's Crystal Ballroom in Hamilton were taxed to capacity last month as some 420 persons gathered there to attend the Ontario Society's Annual Dinner and convocation ceremonies. Of the 116 students graduated by the Ontario Society this year, 103 were on hand to receive their R.I.A. certificates personally from L. G. Simenton, immediate Past President of the Society.

This was the 20th Annual Dinner of the Ontario Society, noted G. A. Elliott, retiring Ontario President and Chairman of the evening. During those years considerable growth had taken place in the Society, he observed, most of it in recent years. In 1945, the first year in which courses were fully implemented, the student enrolment was less than 300. Even by 1951, it had only risen to 634 but today, he said, there were 2,466 Ontario students, an increase of almost 400%.

The results of the educational program as reflected in the number of graduates were only now beginning to be felt, he pointed out. For example, in 1956 there were 30 graduates in contrast to this year's 116. With the numerical strength of its student body now so well assured, Mr. Elliott said he could see a brilliant future for the Society as an ever-increasing number of graduates emerged to take their places in the ranks of business.

Among the head table guests singled out by Mr. Elliott were Mayor Lloyd Jackson of Hamilton; W. W. B. Dick of Moncton, Vice-President of the Canadian Society; H. P. Wright, first President of the Ontario Society; and Dr. S. F. Maine, retiring Director of Extension of the University of Western Ontario, who has been instrumental in establishing the R.I.A. courses in Windsor, London and Brantford.

The guest speaker was Senator Donald Cameron, founder and Director of the Banff School of Fine Arts and one of Canada's foremost educators.

Comparing the educational efforts of the free world with those of the Russians, Senator Cameron said that if democracy is to survive, educational standards must rise whatever the cost. Four steps that he advocated to improve the standard of Canadian education were:

- To raise the standards required of teachers.
- To set salaries high enough to make the teaching profession more competitive.
- To increase the depth of studies at all school levels.
- To provide more efficiently for pupils with greater intellectual capacity—"for we have not played the game with the gifted minorities in this country."

For every dollar Canadians spend on education, $1.60 is spent on luxuries, he observed. "By 1970 our education costs will be more than doubled, to two-and-a-half billion dollars, and even though there will be a bigger population to share the increased costs, you may expect a 50 to 75% increase in school taxes," he said.

THE 1960-61 GRADUATING CLASS of the Ontario Society gathers for this group photo. The presentation of R.I.A. certificates was made at the 20th Annual Dinner of the Ontario Society held at the Royal Connaught Hotel in Hamilton on May 6.

THE INCREASING NUMBER OF WOMEN entering the business world is reflected in the Ontario Society's graduating class this year. Being congratulated by Senator Donald Cameron, above, are the five women who received their R.I.A. certificates, the largest number ever to graduate at one time. From left are: Miss Ruth I. Grant, Toronto; Mrs. M. Irene Stewart, Ottawa; Senator Cameron; Miss Linda Sjoback and Miss Bertha A. Sjoback, Port Arthur; Miss Alice Shaw, Toronto.

He warned that the time may come when there will be a greater measure of compulsion imposed regarding education and its cost. For a long time Canada had lived on the assumption that there was plenty of time to make a choice on the aims and costs of education. "Now," he added, "it is being realized that time is not on our side."

Sacrifice, hard work and discipline were necessary to lift Canada's educational standards, he said—"and if we are not prepared to do this then democracy as a government of consent will not survive."

The winners of the three awards presented for the best theses submitted to the Ontario Society during the years were Alvin H. Seward, Toronto; Victor C. Ibbotson, Highland Creek; and George P. Thompson, Peterborough.

During the afternoon meetings which preceded the Dinner the following were elected to the Executive of the Ontario Society: President, A. Screaton, R.I.A., Toronto; Vice-Presidents, E. W. Scott, R.I.A., Toronto, and C. K. Wolff, R.I.A., Ottawa; Honorary Secretary, R. G. Nelles, C.G.A., R.I.A., Windsor; Honorary Treasurer, H. A. Pakrul, R.I.A., Welland.

CHAPTERS AND MEMBERSHIP

Inter-Chapter Competition

After the closest race on record, the Oshawa District Chapter has won the 1960-61 Inter-Chapter Competition with 3,072 points. Only four points behind was the Winnipeg Chapter with 3,068 and a close third was the Moncton Chapter with 2,907 points.

THE 1960-61 GRADUATING CLASS of the Ontario Society gathers for this group photo. The presentation of R.I.A. certificates was made at the 20th Annual Dinner of the Ontario Society held at the Royal Connaught Hotel in Hamilton on May 6.

This is the first time an Ontario Chapter has won the trophy. It is also the first appearance of a Manitoba or New Brunswick chapter on the top honor list.

Although Oshawa District Chapter held the lead for most of the year, it was seriously threatened in the final stretch by the Winnipeg Chapter. In a last concerted effort to clinch the competition, Winnipeg members sent in several manuscripts during the final week but the points gained were not enough to push the chapter into the lead. However, Winnipeg can take heart from the example of the Oshawa District Chapter which narrowly lost out on first place last year but came through to win the trophy this year.

A major source of points for both the Winnipeg and Moncton Chapters was a considerable increase in the number of new student members. Moreover, Moncton led all of the other chapters in points scored for membership maintenance.

In addition to the handsome oak lectern which forms part of the National President's Trophy, the Chairman of the Oshawa District Chapter receives a return ticket to Vancouver for the presentation of the award at the National Conference. Second and third place chapters receive attractive blue morocco leather folders for use by chairmen at chapter meetings.

Here are the final totals in the 1960-61 Inter-Chapter Competition: Oshawa, 3,072; Winnipeg, 3,068; Moncton, 2,907; Saint John, 2,312; Quebec, 2,249; Grand River, 2,176; Edmonton, 1,953; Saskatoon, 1,939; Calgary, 1,927; Ottawa, 1,921; Vancouver, 1,875; London, 1,829; Victoria, 1,819; Lakehead, 1,806; Eastern Townships, 1,805; Toronto, 1,797; Hamilton, 1,691; Niagara, 1,635; Kingston, 1,475; Regina-Moose Jaw, 1,410; Windsor, 1,410; Cape Breton, 1,355; Peterborough, 1,335; Bay of Quinte, 1,328; Montreal, 1,205; Halifax, 1,077; Fredericton, 1,073; Kent County, 1,053; St. John's, 644; Cornwall, 444; St. Maurice Valley, 335.

SPEAKERS AT THE QUEBEC CHAPTER'S PANEL DISCUSSION of budgeting on March 27 are, from left: Georges Lachance; Robert Després, Moderator; and Paul Amyot.

Quebec Chapter Discusses Budgets

Quebec Chapter for the first time held a special discussion meeting on March 27 around the theme "Basic Policies and Techniques Used in the Preparation of a Company Budget." Moderator of the discussions was Robert Després, Controller of Quebec Power Company, and the panelists were Georges Lachance, Chief Accountant of Ciments du St. Laurent, and Paul Amyot, Administrative Manager of Jos. Vaillancourt Inc.

The speakers introduced the subject with a short commentary on the chief problems of budgeting, then answered questions from the floor, exchanging opinions and personal experiences with the participants. The discussions covered such aspects as preliminary work in the development of a budget, types of budgets, preparation and approval of the budget, its distribution, its results, the analysis of variations in the budget, and the budget revision.

The meeting, arranged by Roger Lefrançois, was planned as a full evening's discussion but was not preceded by the usual dinner. About 40 members attended the meeting and participated so freely in the questioning that the meeting had to be extended by an additional hour. Many requests for the recorded proceedings of the meeting were received from those who could not attend.

The success of the Quebec Chapter's experiment with a new type of meeting is an encouragement to the development of further variety in chapter programming.

CONFERENCES AND SEMINARS

Final Spring Seminars Draw Well

The last two presentations in the current spring series of seminars proved to be among the best attended and received to date.

"Organization and Administration of the Accounting Function", which was held at the Seigniory Club on May 3-5, drew registrants from as far as Vancouver, Calgary and Regina as well as from various points in Ontario and Quebec. Those attending were unstinting in their praise of the seminar subject and the presentations of the moderators. Handling most of the sessions were Frank Willcox, Partner of Price Waterhouse, Montreal, and Donald G. Scott, Vice-President, Administration and Finance, Eldorado Mining and Refining Limited, Ottawa. Performing as special speakers were W. R. "Bill" Corner, Co-ordinator of Data Processing, Canadian National Railways, Montreal, and Eric W. Kierans, President, Montreal Stock Exchange. This seminar will surely be repeated in other centres in the future.

The other of the two presentations mentioned above was on "Direct Costing"—a subject which continues to captivate the interest of accountants. This was the third S.I.C.A. seminar dealing with direct costs and once again it was not possible to accommodate all applications received. Professor André Bisson of Laval University and D. M. Wilson, Controller of the Canadian Chemical Company in Montreal, were the moderators. This one, too, is likely to be repeated next year.

40th Cost and Management Conference

Final planning for the National Conference in Vancouver next June 28-30 is now about complete. The members of the Vancouver Conference Committee feel that this will be one of the finest in our 40 years of history. Certainly all the ingredients for a successful get-together are abundantly in evidence—from practical, down-to-earth technical sessions to a well-rounded entertainment program. Nobody who can possibly arrange to get away from the office should miss this year's "Annual."

PUBLICATIONS AND TECHNICAL SERVICES

Library Service Expands

Stimulated by the publication of the comprehensive Library Topical Index last August, library services have seen as sharp an increase as almost any other area of S.I.C.A. activity.

Over the year, more than 2,500 pieces of literature were sent out in answer to some 900 requests from the members. Most of this literature was dispatched during the peak period September to March. This is in striking contrast to the demand five years ago when 950 pieces of literature were sent out during the year.

At that time, the total number of books, theses and miscellaneous writings added to the library was about 200. Last year 150 books alone were added, while another 150 theses were put on the shelves. The January 1956 **S.I.C.A. News** mentions that 38 periodicals were received and indexed regularly, as well as 13 foreign-language periodicals. Last year the number of English language periodicals rose to 55, while more than 20 foreign periodicals were received by the library.

As more new material has been added, the older and poorer references have been removed from the files. This in itself has been an exacting and time-consuming job requiring careful examination and sifting of material.

Last year also the new photocopy service was offered by the library which has enabled members and others to make a permanent collection of items that they might not be able to obtain otherwise.

PERSONALS

FRANCOIS LETARTE was appointed Secretary of Simons & Co., Limited at a recent meeting of the Board. Mr. Letarte is a General Member of the Quebec Chapter.

G. C. WILLIAMS, F.C.I.S., R.I.A., formerly of the Toronto Chapter, has been appointed Comptroller of the Foundation Company of Canada Limited, Montreal. Mr. Williams has also been elected a Fellow of the Chartered Institute of Secretaries.

J. T. DIXON, B.A., C.P.A., formerly a General Member of the Toronto Chapter, has been appointed Regional Comptroller of Canadian National Railways in Montreal.

I. E. LESNIK, R.I.A., formerly of the Bay of Quinte Chapter, has been appointed Secretary-Treasurer of Cutler-Hammer Canada Ltd., Scarborough, Ontario.

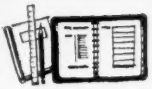
D. H. BEATTY, formerly of the Hamilton Chapter, has been appointed Controller of Black & Decker Mfg. Co. Ltd., Brockville, Ontario.

F. B. GRANT, R.I.A., has been promoted to Administrative Assistant to the Manufacturing Department of Pacific Petroleums Ltd. Mr. Grant is a Director of the Calgary Chapter.

D. A. BURN, R.I.A., formerly of the Winnipeg Chapter, has been transferred to Edmonton as Area Comptroller of the Canadian National Railways.

HARRY L. SHARP, R.I.A., of the Niagara Chapter has been appointed Comptroller of Vallance, Brown & Co. Ltd., Hamilton.

NOLAN HEMBRUFF has been appointed Vice-President and Treasurer of his Company, Triangle Conduit and Cable (Canada) Limited. Mr. Hembruff is a General Member of the Toronto Chapter.



STUDENTS AND COURSES

Examinations Require Long and Careful Planning

The examinations which were completed on May 5 represent a major project for the Society. There were over 5,600 examinations written at more than 80 centres in Canada and in six foreign countries. Examinations were written in England, the Dominican Republic, Greece, Jerusalem, Venezuela and the United States. It was necessary in one case to enlist the aid of a Canadian Embassy to provide space and supervision. In another case, the U.S. Consular Service performed a similar job.

Behind the examinations is a complicated process of preparation and testing. The examinations are prepared by the Central Examination Board and each Board member is responsible for the detail work of one subject.

The Board member responsible for a particular subject draws from an examination question stockpile sufficient questions to make up a complete paper plus an adequate number of alternative questions. The proposed examinations are reviewed by the complete Board which meets in the late fall for this purpose.

The Board, after careful study of each question, selects the questions for each examination from those proposed by the Board member responsible for the particular examination. The Board members are fully informed of the type of questions that have appeared on the examinations in previous years.

The examinations are then tested and the results of the test are reviewed by the responsible member and the Examination Board Chairman in order to correct any weakness.

The papers are then printed, which is complicated by the need for very careful proofreading and by security considerations. The examinations are also translated into French.

Each province organizes the examination centres under its jurisdiction, a process which involves obtaining space and recruiting examination supervisors. All students must be registered and supplied with the necessary data regarding time and place of the examinations.

The marking of all papers is done under the jurisdiction of the Central Examination Board. Every precaution is taken to obtain consistent marking in keeping with the high standards set by the Society.

Although it is realized that every candidate is anxious to receive his marks, the quality of the marking and the accuracy of the reporting cannot be sacrificed for speed. The students will receive their marks as rapidly as possible under the "quality control" conditions set by the Central Examination Board.

QUESTION 7 (10 marks)

The Canadian Underwear Co. manufactures a large variety of women's garments and employs one thousand female workers in its various production departments.

Some time ago, a time and motion study engineer was hired to make a complete analysis of the methods of production. You are chairman of a committee which has been assigned the task of studying very closely the findings and recommendations of the engineer before making any change in the existing production set-up.

The committee is presently discussing a suggestion aiming at the reduction of the time required for a particular operation. The operation is performed on all

products and takes ten minutes or approximately 30% of total productive labour. It is claimed that, by applying a new method, twenty seconds per item could be saved.

One of your colleagues on the committee, although recognizing that no investment would be necessary, holds that the time saved is too insignificant to be worth bothering about.

REQUIRED:

Discuss your colleague's comment and explain whether you agree or disagree with his viewpoint.

SOLUTION 7

The answer to this question first required calculation of the value of the proposal as follows:

A. Saving per item = 20 secs. $= \frac{20}{60}$ min.

B. Total Time per item $= 10 \times \frac{100}{30}$ min.

Overall % saving $= \frac{A}{B} = \frac{20}{60} \times \frac{1}{10} \times \frac{30}{100} = 1\%$ productive labour.

Assume rate of pay \$1.50 per hr. and a work-week of 40 hrs. for the 1,000 productive workers employed. Then dollar value of saving =

$1{,}000 \times \$1.50 \times 40 \times \frac{1}{100} = \$600.$ per week.

After completing the above calculation a recommendation to adopt the suggestion should be made.

Other reasons for adopting the suggestion would be:

1. A reduction in the break-even point would be allowed.
2. A loose piece-work rate would be eliminated.
3. No investment is required.

While not required, marks were allowed for any disadvantages, such as:

1. Resistance from the labour force on the basis of "rate cutting".
2. Administrative costs.

COMMENT TO QUESTION 7

This question was generally not well handled, although some students earned full marks on it.

The major weakness was the inability to solve the relatively simple mathematical problem of evaluating in dollars the magnitude of the proposed saving; and then proceeding on this basis to develop a sound argument supporting the proposal.

A number of students failed to state clearly whether or not they agreed or disagreed with the expressed viewpoint, but instead only discussed the problem when a definite opinion was required.

Some students attempted to answer the question without first solving the mathematical problem and thereby lost a substantial portion of the marks allowed for the question.

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